ORDER NO. HAD8801018C0
A6

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-P770

Color

(K) .... Black Type

Color	Area
(K)	[M] ..... U.S.A.
(K)	[MC] ... Canada.
(K)	[E] ..... Continental Europe.
(K)	[EK] .... United Kingdom.
(K)	[XL] .... Australia.
(K)	[EG] ... F.R.Germany.
(K)	[EB] .... Belgium.
(K)	[EH] .... Holland.
(K)	[EF] .... France.
(K)	[Ei] ..... Italy.
(K)	[XA] .... Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[XB] .... Saudi Arabia.
(K)	[PA] .... Far East PX.
(K)	[PE] .... European Military.
(K)	[PC] .... European Audio Club.

SPECIFICATIONS

■ Audio

No. of channels:	2 (left and right stereo)
Frequency response:	2~20.000 Hz ±0.2 dB
Output voltage:	2.5 rms V (at 0 dB)
Dynamic range:	100 dB
S/N ratio:	113 dB
Harmovic distortion:	0.0013% (1 kHz, 0 dB)
Total harmonic distortion:	0.0025% (1 kHz, 0 dB)
Channel separation:	110 dB
Wow and flutter:	Below measurable limit
Low-pass filter:	Hight Resolution Digtal Filter
Output impedance:	Approx. 600Ω
Load impedance:	More than 10 kΩ
Headphone output level:	100 mW max. 32Ω (adjustable)

■ Signal format

Sampling frequency:	44.1 kHz
Correction system:	Technics Super Decoding Algorithm
D-A conmversion:	16-bit inner

■ Pickup

Type:	Fine-focus one beam
Light source:	Semiconductor laser
Wavelength:	780 nm
Traverse system:	High-speed linear access system
Spindle system:	Brushless DD motor

■ Infrared remote control transmitter

Dimensions (W×H×D):	73 × 22 × 181 mm (2-7/8" × 7/8" × 7-1/8")
Batteries:	UM-4 "AA" batteries or IEC-R03 or equivalent (1.5 V × 2)
Weight:	130 g (including batteries) (0.28 lbs)

■ General

Power supply:	For U.S.A. and Canada: AC 120 V, 60 Hz For United Kingdom and Australia: AC 240 V, 50 Hz For Continental Europe: AC 220 V, 50 Hz For Others: AC 110~127 V/ 220~240 V, 50/60 Hz
Power consumption:	16 W
Dimensions (W×H×D):	430 × 129 × 333 mm (16-15/16" × 5-3/32" × 13-1/8")
Weight	8.1 kg (17.9 lbs)

Specifications are subject to change without notice.
Weight and dimensions are approximate.
Measured by EIAJ (CP-307).

Technics

Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc.
Ave. 65 De Infanteria, Km. 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

Panasonic Hawaii, Inc.
91-238, Kauhi Street, Ewa Beach
P.O. Box 774
Honolulu, Hawaii 96808-0774

Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome,
Minato-ku, Tokyo 105, Japan

SL-P770

■ CONTENTS

	Page
SAFETY PRECAUTIONS	2
PRECAUTION OF LASER DIODE	3
BEFORE USING THIS UNIT	3
FRONT PANEL CONTROLS AND FUNCTIONS	4~5
REMOTE CONTROL TRANSMITTER	6
CONNECTIONS	6
OPERATION	7~9
CONVENIENT FUNCTIONS	10
RECORDING FROM COMPACT DISCS	12
HANDLING PRECAUTIONS FOR OPTICAL PICKUP	15
DISASSEMBLY INSTRUCTIONS	16~19
MEASUREMENTS AND ADJUSTMENTS	20~26
SCHEMATIC DIAGRAM OF REMOTE CONTROL UNIT	27
SCHEMATIC DIAGRAM	28~34
PRINTED CIRCUIT BOARD AND CONNECTION DIAGRAM	35~38
REPLACEMENT PARTS LIST (Electric parts)	39~40
EXPLODED VIEWS	41~43
REPLACEMENT PARTS LIST (Mechanical parts)	44
REMOTE CONTROL UNIT PARTS	45
PACKING	46
RESISTORS AND CAPACITORS	47~49
BLOCK DIAGRAM	50~52
TERMINAL FUNCTION OF LSI	53~57
INTERNAL CONNECTION OF FL	58

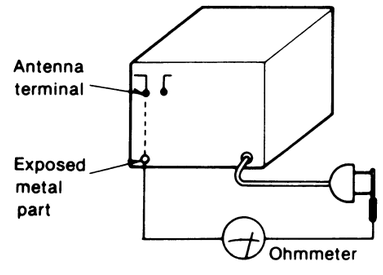
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

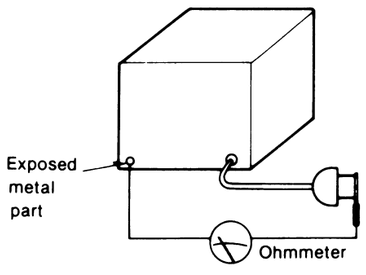
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

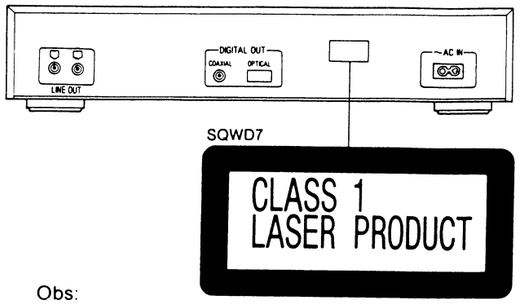
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

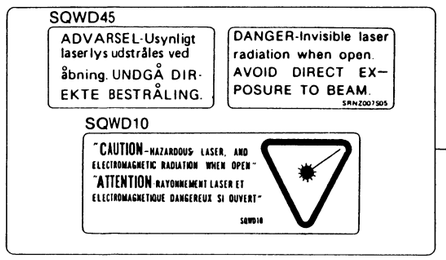
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

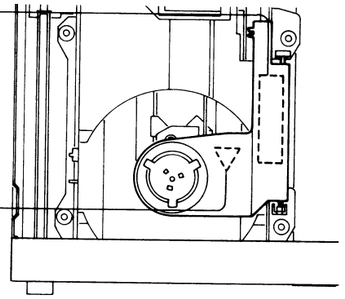
- **Use of caution labels** Note ○ Mark is used, × Mark is not used.

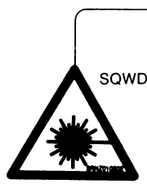
Areas	SQWD45	SQWD10	SQWD7	SQWD19
[MC]	×	○	×	×
[E]	○	×	○	○
[EK], [XL], [EG], [EB], [EH], [EF], [Ei], [XA], [XB]	○	×	○	○



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.


SQWD45
ADVARSEL-Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
DANGER-Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
SQWD10
"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN-
"ATTENTION-RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"



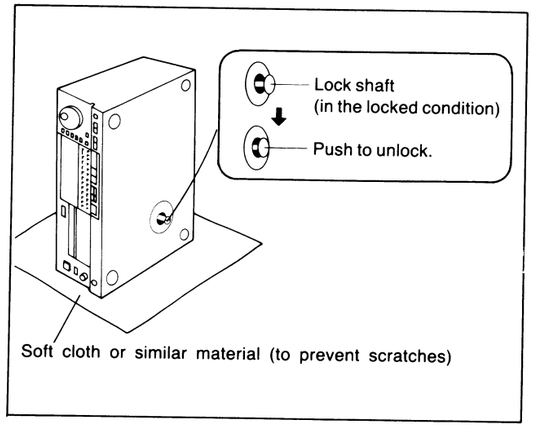


VAROITUS! Laite sisältää laserdiodin,
joka lähettää näkymätöntä silmille
vaarallista lasersäteilya

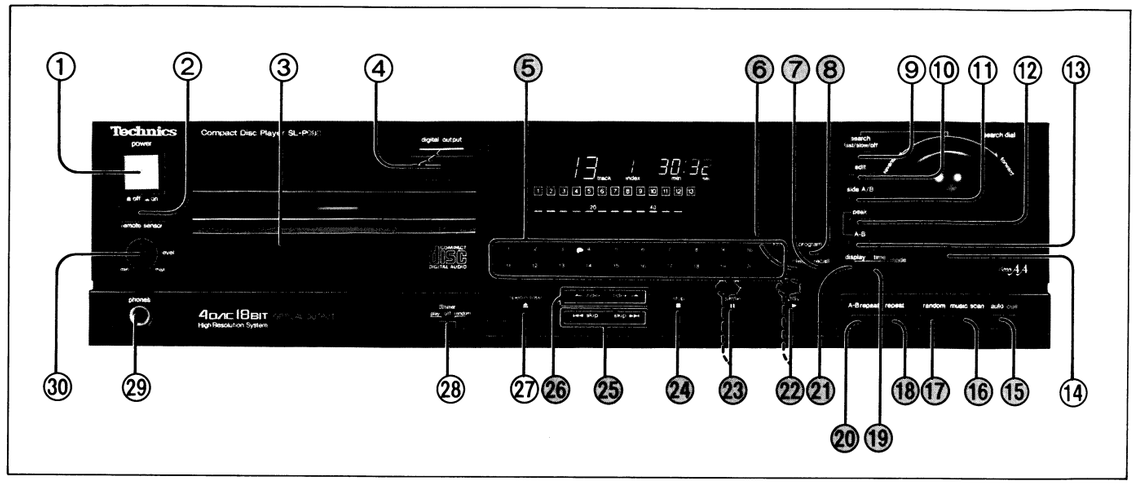
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (■→▬).

NOTE:
IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:
1) Remove the disc from the holder.
2) Pull the lock shaft to the out (LOCK) position (▬→■).
CAUTION:
Do not transport the unit without locking the lock shaft.
SEVERE DAMAGE WILL RESULT.



■ FRONT PANEL CONTROLS AND FUNCTIONS



Control section

① Power switch (power)

② Remote-control signal receptor (remote sensor)

③ Disc holder

④ Digital output button/indicator (digital output)
While this indicator illuminates, compact-disc sounds can be output (as digital signals) from the digital output terminals on the rear panel of this unit.

⑤ Numeric buttons (1~20, +10, 0)
These buttons can be used to select the track numbers and the recording time.

⑥ Clear button (clear)

⑦ Recall button (recall)

⑧ Programmed-play button (program)

⑨ Search-speed select button (fast/slow/off)
This button can be used to select the speed when using the search dial to locate the beginnings of tracks.
fast:
Set to this position to search at high speed. (One turn of the dial is equivalent to about 25 seconds.)
slow:
Set to this position to search at slow speed. (One turn of the dial is equivalent to about 1 second.)
off:
Set to this position when the search dial is not being used.

⑩ Compact-disc edit button (edit)
When compact-disc sounds are to be recorded to tape, this button can be used to calculate the number of tracks that can be recorded on the two sides of the tape, considering the length of the cassette tape used, so that there is no interruption of tracks.

⑪ Tape-side select button (side A/B)

⑫ Peak-level search button (peak)
This button can be used to locate the maximum signal level (peak level) for the signals on the disc. This is a convenient feature that helps when adjusting the recording level when compact-disc sounds are to be recorded to tape.

⑬ A-B peak-level search button (A-B)

⑭ Search dial (search dial)

⑮ Automatic play stand-by button (auto cue)

⑯ Music scan button (music scan)
This button can be used to play the first part of each track in order.

⑰ Random-play button (random)
This button can be used to select "random" play (the unit's microcomputer selects the sequence of track play in a random order).

⑱ Repeat button (repeat)

⑲ Time-display select button (time mode)

⑳ A-B repeat button (A-B repeat)

㉑ Display-mode select button (display mode)
This button can be used to select, each time it is pressed, either the display of the play position of the disc, or the display of the output level, by the indicator.

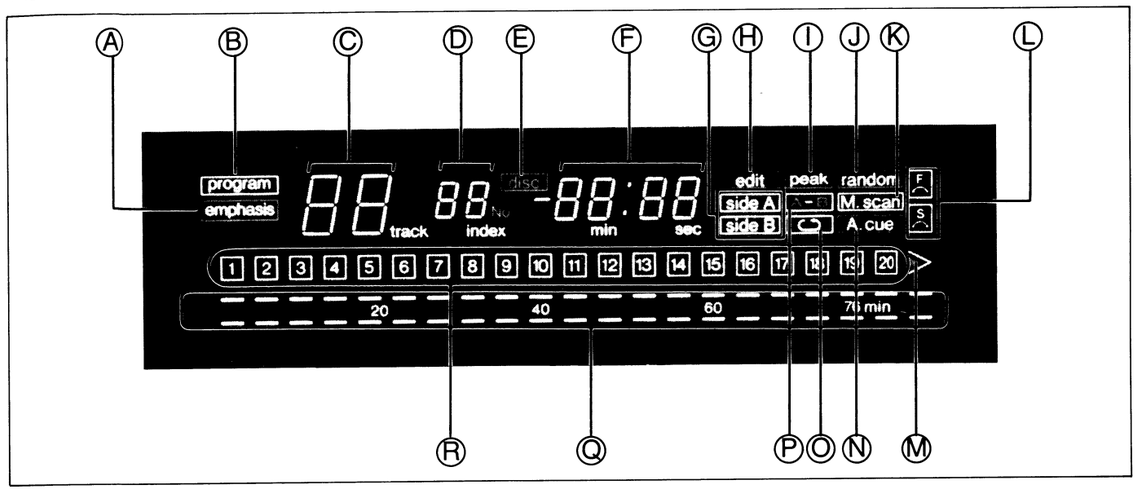
㉒ Play button/indicator (play/▶)

㉓ Pause button/indicator (pause/❚❚)

㉔ Stop button (stop/■)
This button can be used to stop the disc play, as well as to cancel the various play modes.

㉕ Skip buttons (⏮ skip/skip ⏭)

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.



㉖ Index-skip buttons (⏮ index/index ⏭)

These buttons can be used to skip to any desired index number, after which play begins from that point.

> **What index numbers are...**
> Index numbers are sub track numbers used to subdivide tracks into smaller parts for reference purposes.
> Compact discs that have such subdivisions are indicated by the symbol INDEX on the notes and commentary that accompany the disc.

㉗ Disc holder open/close button (open/close/⏏)

㉘ Timer stand-by switch (🕒 timer)

㉙ Headphones jack (phones)

㉚ Headphones volume control (level)

㉛ Search buttons (◀◀ search ▶▶)

These buttons can be used to locate a desired part of the disc at high speed (forward or reverse) during disc play. (The search speed is slow when the button is first pressed, and becomes faster if the button is pressed and held continuously.)

(For the remote-control transmitter only.)

Indicators section

Ⓐ Emphasis indicator (emphasis)

The sounds on some compact discs are sounds that are re-recordings (as digital signals) of a sound source originally recorded as analog signals.
For some discs of this type, the signal characteristics have been corrected (emphasized), and this indicator illuminates when such discs are loaded in this unit.
For such discs, the output level will be displayed as slightly higher than for analog signals.

Ⓑ Programmed-play indicator (program)

Ⓒ Track number display (track)

Ⓓ Index-number display (No./index)

This display shows the index number as well as the sequence of programmed play.

Ⓔ Disc indicator (disc)

This indicator illuminates when a disc is loaded.

Ⓕ Time display

Ⓖ Tape side indicator (side A, side B)

Ⓗ Compact-disc edit indicator (edit)

Ⓘ Peak-level search indicator (peak)

Ⓙ Random-play indicator (random)

Ⓚ Music scan indicator (M.scan)

Ⓛ Search-speed indicators (F, S)

Ⓜ "Over" mark (▶)

The "▶" indicator illuminates if the total number of tracks on the disc is 21 tracks or more.
When the play reaches the 21st track and thereafter, the ">" begins flashing.

Ⓝ Automatic play stand-by indicator (A. cue)

Ⓞ Repeat indicator (↻)

Ⓟ A-B repeat indicator (A-B)

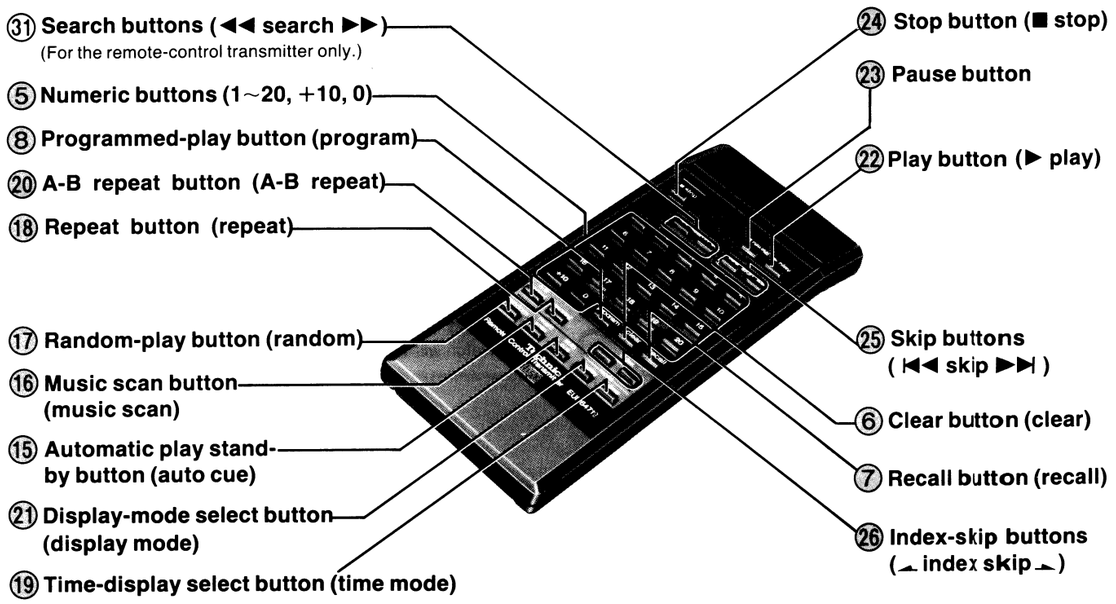
Ⓠ Play-position/digital output-level indicator

Ⓡ Music matrix (1~20)

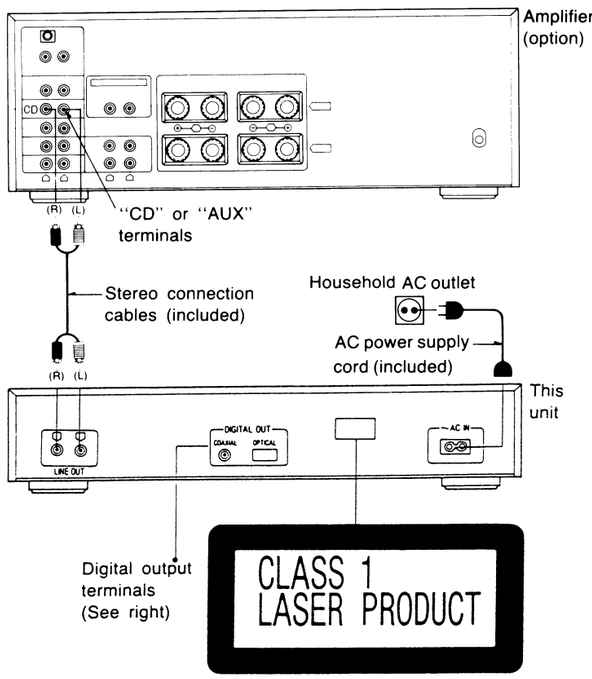
The numbers of the tracks on the disc are displayed up to a maximum of 20.

■ REMOTE CONTROL UNIT PARTS

EUR64712 ..... For U.S.A. and Canada
EUR64713 ..... For others


㉛ Search buttons (◀◀ search ▶▶)
(For the remote-control transmitter only.)
⑤ Numeric buttons (1~20, +10, 0)
⑧ Programmed-play button (program)
⑳ A-B repeat button (A-B repeat)
⑱ Repeat button (repeat)
⑰ Random-play button (random)
⑯ Music scan button (music scan)
⑮ Automatic play stand-by button (auto cue)
㉑ Display-mode select button (display mode)
⑲ Time-display select button (time mode)
㉔ Stop button (■ stop)
㉓ Pause button
㉒ Play button (▶ play)
㉕ Skip buttons (⏮◀◀ skip ▶▶⏭)
⑥ Clear button (clear)
⑦ Recall button (recall)
㉖ Index-skip buttons (⏮ index skip ⏭)

■ CONNECTIONS



Digital output terminals (DIGITAL OUT)

The output signals of this unit are output from these terminals as digital signals.

• Coaxial terminal (COAXIAL)
This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using a coaxial cable. (included)

• Optical terminal (OPTICAL)
This terminal can be used for connection with other equipment that has a digital input terminal, such as an amplifier, by using an optical cable (included). A dust-protection cap is inserted in this terminal. Remove this cap only when a connection is to be made to this terminal.

CAUTION

When using the optical cable, please keep the following points in mind:

1. The maximum length of optical cable to be used with this unit is 3 m (approx. 10 ft.).
2. Always make sure the plug is fully inserted. If the plug is not inserted all the way, an imperfect connection will result.
3. The optical cable must never be bent or coiled tightly. Doing so will permanently damage the optical fiber in the cable and, therefore, prevent proper data transmission. If the cable must be coiled (for storage, etc.), the diameter of the loop should be at least 15 cm (approx. 6 inches).
4. Handle the optical cable's plug very carefully. Keep the plug free from dust or damage. Dust can be removed by wiping the plug with a soft cloth. Do not use any cleaners or solvents to clean the plug.

■ OPERATION

The following explanation will use, as an example, a compact disc on which are recorded 13 tracks, with a total playing time of 30 minutes and 32 seconds.

Listening a disc from beginning (automatic play)

The track will be played from the first track to the final track in order.
The operations described below are the basic operations when listening to a compact disc. Follow steps 1, 2, 3 and 4 in the same way for another performance.

Note: Have you released the lock shaft?

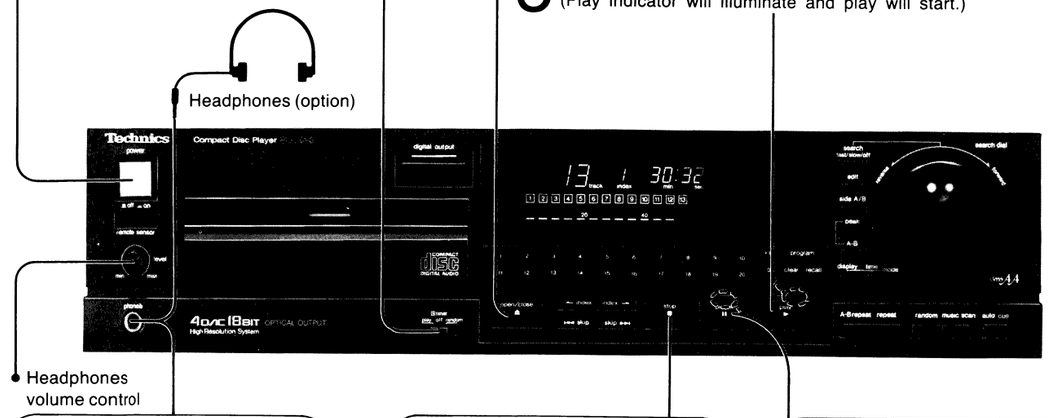
1 "off"

2 Reduce the volume level (at the amplifier), and then switch ON the power.

3 Press open/close, and insert the disc. (See 1 below).

4 Press open/close. (See 2 below).
(The holder will close, and the disc will begin to rotate.)

5 Press play. (See 3 below).
(Play indicator will illuminate and play will start.)



When listening through headphones

- Set the headphones volume control to low position before connecting headphones.
- Use the headphones volume control to adjust the volume while listening to music.

To stop disc play

Press the stop button.
(Some play modes will be cancelled.)

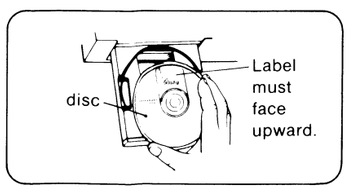
After use

- Remove the disc from the disc holder.
- Close the disc holder.
- Turn off the power.

To temporarily stop disc play

Press the pause button.
(The pause indicator will illuminate.)
Press the play button again to resume the play.
(The pause indicator will go out.)

1 To insert a disc:



Do not try to insert a disc until the holder has opened completely, because the disc may be scratched if it is inserted sooner.
Discs of the 8-cm (3") size and 12-cm (5") size cannot be used together.

2 The indicator will display:

The total number of tracks and the total play time will be displayed.

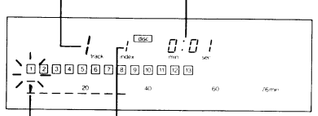
Total play time is also indicated by the number of bars.

Note:
You may notice that there is a slight difference (a few seconds) between the time displayed for each track and the time shown in the notes included with the disc. This is because the displayed time includes the time between tracks.

Illuminates when there are 21 or more tracks.

3 The indicator will display:

The track number and the elapsed play time will be displayed.



For discs without index numbers, "/" will be continuously displayed.

The track number flashes during play, and then disappears when play finishes.

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.

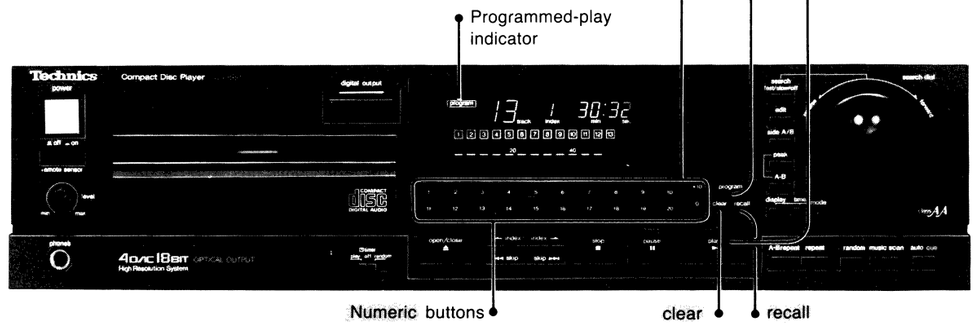
Programmed play

- To listen in any desired order. (The explanation below shows when the 7th track is first, the 4th track second, the 2nd track last.)
- A maximum of 32 tracks can be programmed.

1 Press program.
(The programmed-play indicator will illuminate.)

2 Select the track numbers in the desired sequence of play by using the numeric buttons.
(See 1 below).
(If a track number not included on the disc is programmed, it won't operate. If 33 tracks or more are programmed, the "-/-" display will appear, and the programming cannot be made.)

3 Press play.
(Play will start in order.)
(See 2 below).



To verify the programmed sequence

Press the recall button.
(Each time the button is pressed, the programmed sequence and the track number will alternately be displayed.)

To add a programmed selection during disc play

Use the numeric buttons to select and program the desired track.
Each time the button is pressed, the number of the specified track and the programmed sequence will be displayed. After 2 seconds, the display returns to show the current time.

To cancel or change the programmed track in the previous step

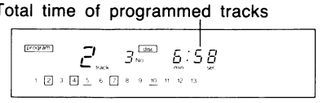
Stop the disc play first.
① Press the recall button until the number corresponding to the track to be cancelled appears on the display.
② Press the clear button. (The music matrix corresponding to the programmed track recalled in the previous step will stop illumination, and the selection will be cancelled.)
③ Use the numeric buttons to select and program some other desired track.
(It will be added as the final track.)

To cancel or change the most recently programmed track

Stop the disc play first.
① Press the clear button. (The music matrix corresponding to the most recently programmed track will be disappeared, and the selection will be cancelled.)
② Use the numeric buttons to select and program same other desired track.

1 The indicator will display:

(Display after programming)
Total time of programmed tracks



The total time of programmed tracks will appear in the time display; if the total exceeds 99 minutes the "--:--" display will appear.

Notes:
- To select the 21st and subsequent tracks:
Press the +10 button to select the "tens" digit, and then press (one of) the 0 – 9 buttons to select the "units" digit.
Example: to select the 32nd track
Press the +10 button three times to select 3, and then press the 2 button.
- If the stop button is pressed while the programming is in progress, the already programmed data will be retained in the unit's memory and the unit will change to the stop mode. If the button is thereafter pressed (while the unit is in the stop mode), the programmed data will be erased.

2 To cancel:

Press the program button.
(The programmed-play indicator will go out.)

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.

To listen immediately to certain track (direct play)

A one-touch selection permits the immediate play of, for example, the 3rd track on the disc.

Press to select the track number desired.

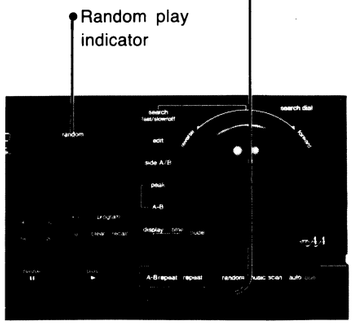
(See [1] below).
(The play indicator will illuminate, and play will begin.)

To listen to tracks in random sequence (random play)

The unit's microcomputer selects the sequence of play in random order. This feature can, moreover, be combined with the repeat play feature (described at the right) for repeated random sequence play of all tracks (or of only the programmed tracks), making these two features ideal for background music play.

Press the random button.

(The random-play indicator will illuminate, and the play will begin.)
(See [2] below.)

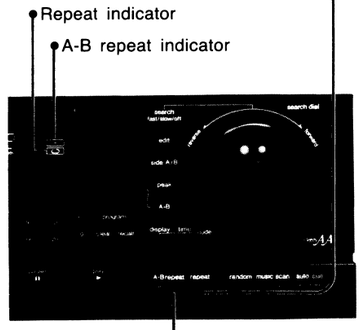


To listen to tracks repeatedly (repeat-play)

To repeat all tracks or certain programmed tracks...

Repeat play is possible:
- Of all tracks (during automatic play and random play).
- Of programmed tracks (during programmed play).
- From the specified track to the final track (during direct play), after which there is a return to the first track, and then all tracks are repeatedly played.

Press the repeat button before or during play. (See [3] below.)
(The repeat indicator illuminates.)



To repeat desired places (A-B repeat play)

① **Press A-B repeat at the place where you want the repeat performance to begin** (to select point A).
(The "A-" portion of the A-B repeat indicator will illuminate.)
② **Press A-B repeat at the point where you want to end the repeat play** (to select point B).
(The "A-B" portion of the A-B repeat indicator, and the repeat indicator will then illuminate.)
(See [4] below.)

[1] **When the playing of the specified track has finished.**
Next recorded track will be played.

Notes:
- If a selection is made while programmed tracks are being played, the selected track will be added to those already programmed.
  (The direct play does not function.)
- If a track number not included on a disc is specified, it won't accept.

[2] **To cancel:**
Press the random button once again.
(The illumination of the random play indicator will stop, and the unit will resume ordinary play.)

[3] **To cancel:**
Press the repeat button again.
(The illumination of the repeat indicator will stop.)

[4] **To cancel:**
Press the A-B repeat button again.
(The illumination of the A-B and repeat indicators will stop.)
The A-B repeat play feature does not function during the programmed play mode.

■ CONVENIENT FUNCTIONS

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.

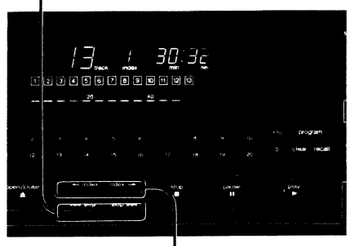
To listen to certain tracks in random order (skip play)

When, while a track is playing, you decide you want to listen to the next track, or to listen once again to the track now playing, either track can be quickly and easily located for play.
While watching the track number display, press until the number of the desired track appears.

Note:
When a skip button is pressed during the A-B repeat play mode, A-B repeat play will be cancelled.

To skip tracks

- **Press the ⏮ skip button to listen to the track now playing, or to a track already played.**
- **Press the skip ⏭ button to listen to the next track.**



To skip index numbers

- **Press the ← index button to listen to the index now playing, or to a index already played.**
- **Press the index → button to listen to the next index.**

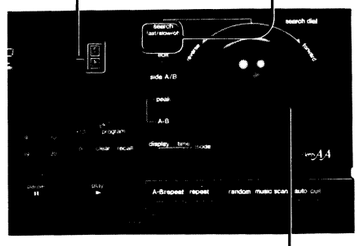
Note:
Skip play of index numbers is limited to those compact discs that include index numbers.
(Whether or not a disc includes such index numbers is noted in the notes and commentary accompanying the disc.)

To search for a certain track (search play)

Using the main unit controls for search

The beginning of a track can be located with a high degree of precision by using the search dial to listen to the play sounds.
The unit can, moreover, be set to the play stand-by mode by press the pause button after locating the beginning of a desired track.

1 Select the speed mode by the fast/slow/off:
(The respective indicator will then illuminate.) (See [1] below.)



2 Search for the desired position.
Turn to the right to move forward on the disc.
Turn to the left to move backward on the disc.

Using the remote-control transmitter for search

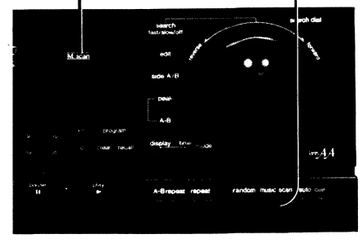
By using the search buttons, the desired track(s) can be located while listening to the disc's sounds (at a level about 1/4 of the level during ordinary play).
- **To move backward quickly on the disc, press and hold ◀◀, and then release it at the desired position.**
- **To move forward quickly on the disc, press and hold ▶▶, and then release it at the desired position.**

To locate a desired track (music scan)

The first part (about 15 seconds) of each track is played in sequence one after another.
This feature is convenient if you do not know the title of a track you want to listen to, and if you do not know the track number.

Press the music scan button.

(The music scan indicator will illuminate, and play will begin.)
(See [2] below.)



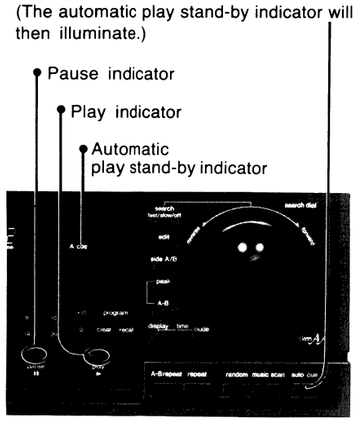
[1] ● Although the search speed will vary according to the speed at which the dial is turned, the speed will not exceed the speed set for each mode.
● During the programmed play mode it is only possible to search and locate from among the tracks being played. To go to some other track, use the skip function to find its beginning.
● For A-B repeat play, it is possible to search outside the A-B pattern. Then, when play button is pressed, there will be a return to between the A-B points originally selected.

[2] ● When the music scanning finishes, it will be automatically cancelled, and play will begin from the beginning of the first track.
● If the play button is pressed during music scanning, there will be a change to play at that point (the music scanning will be cancelled.)

Automatic disc play stand by setting (automatic cueing)

Each time a track finishes playing, the play pauses (in the stand-by, or "cue", mode) at the beginning of the next track scheduled for play.
This feature can be conveniently used for such uses as starting the track's play after first making an announcement (at a party for example) or to start play at a precise moment for some reason.

Press the auto cue button.
(See [1] below).
(The automatic play stand-by indicator will then illuminate.)

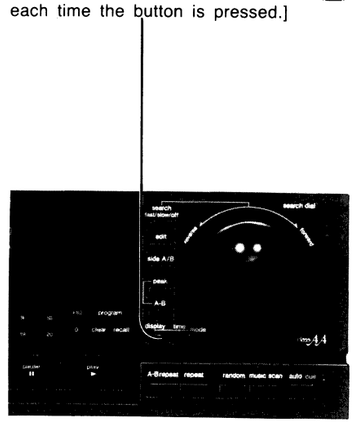


■ To resume the play:
Press the play button.

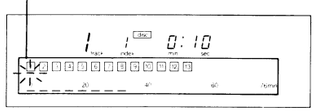
Changing the indications shown by the display

The display can be used for display of the play position and for display of the output level.

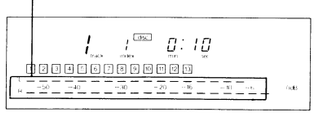
Press display mode button.
[The displays change as shown below ([2]) each time the button is pressed.]



■ Display of the play position



■ Display of the output level

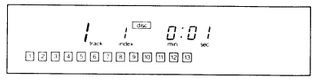


Changing the indications of the time mode display

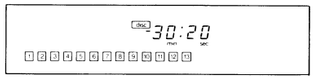
The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.

Press time mode button.
(During play mode or pause mode.)
(See [3] below).
The displays change as shown below each time the button is pressed.

•Track number and elapsed play time of track currently being played.
(Condition before button is pressed.)



•Total remaining time on the disc



During the programmed play mode, the total remaining play time of programmed tracks.
When the compact-disc editing function is being used, the remaining time available on the side (A or B) of the tape being used for recording.

•Track number remaining time of track now playing

•Total elapsed play time

During the programmed play mode, the total elapsed play time of programmed tracks.
When the compact-disc editing function is being used, the tape-travel time.

[1] When the unit goes to the beginning of the next track scheduled for play, the unit goes on the pause mode; pause indicator will illuminate and play indicator will go out.

■ To cancel:
Press the auto cue button.
(The illumination of the automatic play stand-by indicator will then stop.)

[2] **•Play-position display**
The total play time will be indicated by a broken bar-line type of display. Each bar segment represents about four minutes. The relative position (on the disc) now playing is indicated by the flashing of the bar segment.
•Output-level display
The digital output level is displayed, and the maximum output level at any given time remains displayed for about two seconds. (This is the "peak-hold" function.)

[3] **Notes:**
The "--:--" display will appear;
- When the 33rd track (or higher) is played.
- When the 33rd track (or higher) is programmed.
- When the total programmed time exceeds 99 minutes.
- During the random play mode.

■ RECORDING FROM COMPACT DISCS

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.

To edit while recording from compact discs

If the editing function of this unit is used when recording from compact discs to tape, the tracks can be recorded on the two sides (sides A and B) of the tape, considering the length of the tape used, so that there is no interruption of tracks at the end of one tape side.
In addition, an unrecorded space (of three seconds in length) is automatically made after the play of each track is finished. (This is the automatic-spacing feature.)

Automatic editing (recording in the sequence in which tracks are recorded on the compact disc or in the sequence in which desired tracks are programmed for play)

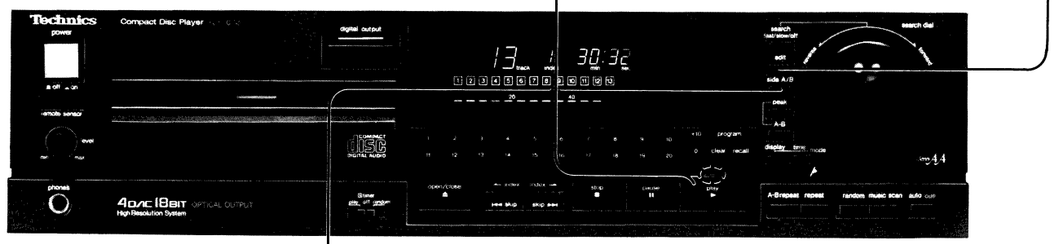
For automatic editing, the unit automatically calculates which tracks can be recorded on both sides of the tape (in the sequence in which they are recorded on the compact disc, or in the sequence in which certain desired tracks are programmed for play) and, after making this calculation, the unit programs those tracks for play.

1 Set the tape deck to the recording stand-by mode.

2 Select the tracks you want to record.
(See [1] below.)

3 Press the edit button, and then select the length (C-46, C-60, C-90 or C-0) of the tape to be used for recording.

4 When the tape deck begins recording, press the play button of this unit at the same time.
(Play indicator will illuminate, and play will start.)



To verify the tracks to be recorded on side B (during the stop mode)

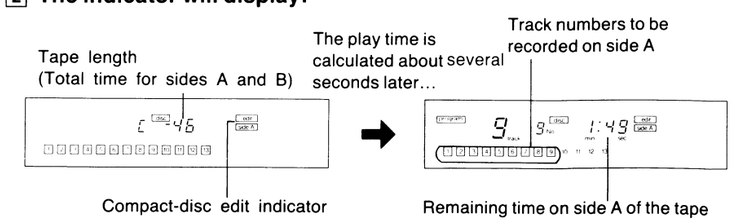
Press the side A/B button.
(The side B indicator will illuminate, and the track numbers to be recorded on side B, and the total play time, will be displayed.)

When the play of tracks programmed for side A has finished

Locate the beginning of the tracks programmed for side B, and then change to the pause mode.
① Prepare the tape deck (in the recording stand-by mode) so that it can be recorded to side B of the tape.
② Follow step 4 above.

[1] When the tape length is selected (in step 3) after a total programmed time exceeding 99 minutes is programmed and the symbol "--:--" appears in the display, the symbol "-E" will then appear, and further programmings can not be made.
When 33 or more tracks are programmed, the letter "-F" (full) will be displayed, and programming will not thereafter be accepted.
Note:
The only operation-control buttons that can be used during disc play while the editing function is being used are the digital output, open/close and stop buttons; all others are non-operational at this time.

[2] The indicator will display:


Tape length
(Total time for sides A and B)
The play time is calculated about several seconds later...
Track numbers to be recorded on side A
Compact-disc edit indicator
Remaining time on side A of the tape

The functions indicated by the shaded frames can also be activated by using the remote-control transmitter's controls.

Manual editing (maximum recording efficiency according to remaining tape time)

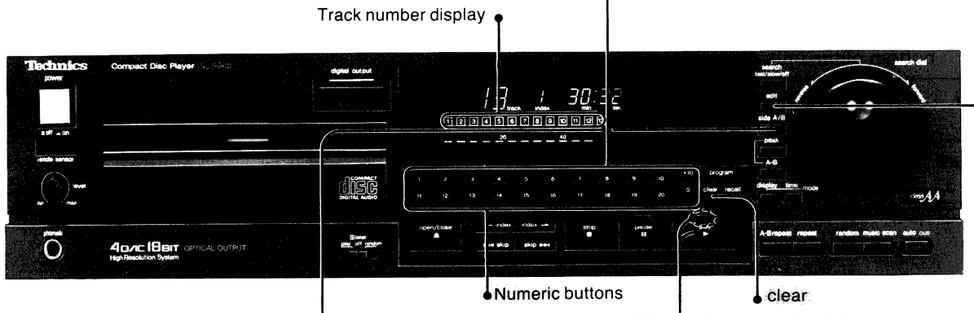
For manual editing, the amount of time remaining available for recording is automatically calculated after each track to be recorded is programmed, and that remaining time is displayed in the time display.
This makes it possible to select tracks that most nearly match the tape length (remaining time on the tape).

1 Set the tape deck to the recording stand-by mode.

2 Press the edit button, and then select the length (C-46, C-60, C-90 or C-0) of the tape to be used for recording.

3 Press the clear button so that "0" appears in the track number display. (See 5 below.)
(The track numbers programmed by the automatic editing function will be erased from the memory.)

4 Using the numeric buttons, program the numbers of the tracks to be recorded.
(See 6 below.)



5 Press the side A/B button so that the display for side B of the tape appears, and then follow steps 3 and 4 above.

Notes:
- If the tape length is insufficient at steps 4 and 5 and the recording is made anyway, the track being recorded when side A of the tape reaches its end will be interrupted, and the recording on side B of the tape will begin from the first track already programmed for side B.
- To change the track, follow the steps on page 10.

6 When the tape deck begins recording, press the play button of this unit at the same time.
(Play indicator goes on and the recording from the compact disc will begin.)

---

3 Select C-0 if the recording time is to be other than 46, 60 or 90 minutes.

Using the numeric buttons, select the total recording time (1 to 99 minutes) for sides A and B of the tape.

① For a recording of 20 minutes on each side (A and B) of the tape, press the +10 button four times, and then press the 0 button.
② For a recording of 40 minutes on side A, press the +10 button eight times, and then press the 0 button.
(If an error is made, select C-0 and then repeat the procedure correctly.)

4 To cancel:

Press the stop button.
(Press once if a disc is in the stop mode and press twice if a disc is playing.)

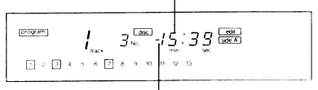
5 The indicator will display:

(The display of track numbers displayed during automatic editing is erased in sequence, and the recording time for side A of the tape is displayed.)

Tape side A recording time

6 The indicator will display:

The remaining time is displayed in sequence.



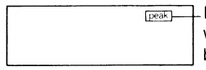
Illuminates when the tape length is insufficient.

For precise adjustment of the recording level (peak-level search function)

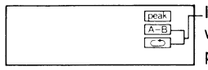
The peak-level search function is a feature that makes it possible to locate the maximum signal level (peak level) among all tracks or between any two selected points (between points A and B on the disc), and then to repeatedly play that portion (including approximately three seconds before and after the peak level, so, total of six seconds), thus making it conveniently easy to preset the recording level to the correct level before beginning the recording.
To check the output level, press the display mode button to change the indicator to display of the output level.

1 Set the tape deck to the recording stand-by mode.

2 Press the peak button while the unit is in the stop mode.
Detects the peak level (from among all tracks or among programmed tracks); after completion, there is repeat play of about six seconds.



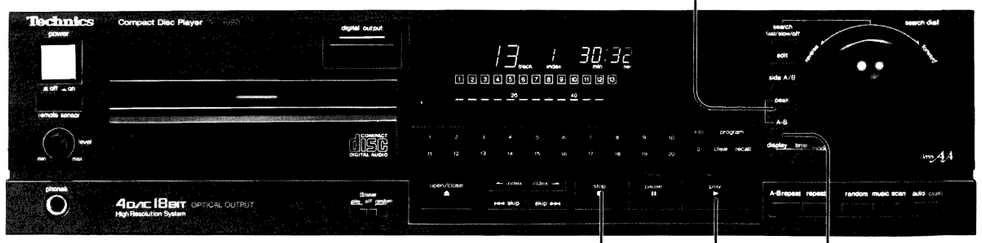
Illuminates when the peak button is pressed.



Illuminates when repeat play begins.

Notes:
- The search for the peak level will begin from the first track, so about three minutes will be required until the detection finishes.
- It is possible that the peak-level position will change, because the detection of the peak level is an approximate reading of the digital level of the sounds on the compact disc.

3 Adjust the recording level by using the recording-level control on the tape deck.



4 Press the stop button to stop the six second repeat play.
(The peak-level search indicator and A-B repeat indicator and repeat indicator will go out.)

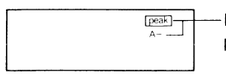
5 Set the tape deck to start recording.

6 Press the play button.
(The recording from the compact disc will begin.)

To find the peak level with even greater precision (during play mode)

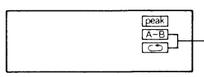
While following the steps described above, substitute the follow on step 2.

1 Press the A-B button at the point where you want the detection of the peak level to start.



Illuminates when A-B press once.

2 Press the A-B button at the point where you want the detection of the peak level to stop.
(Six-second repeat play will start.)



Illuminates when A-B press again.

To cancel the recording-level adjustment

- **Press the stop button.**
(The illumination of the peak-level indicator stops, and play stops.)

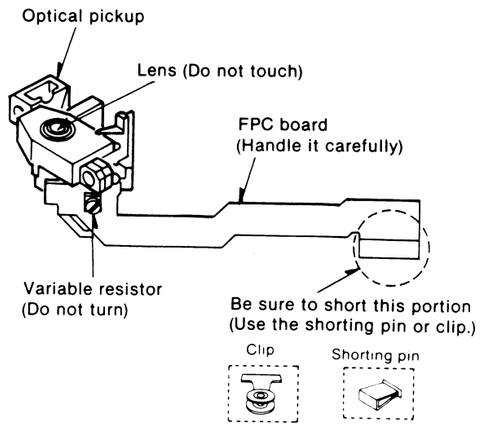
1. Do not attempt to perform such operations as search play or skip play during the peak-level search mode.
(Correct peak levels cannot be located.)
2. If the B position (the position at which the search is to end) is not designated for A-B peak-level search, the search will continue through the final track.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

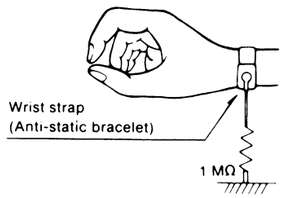
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. **(FPC board)**
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

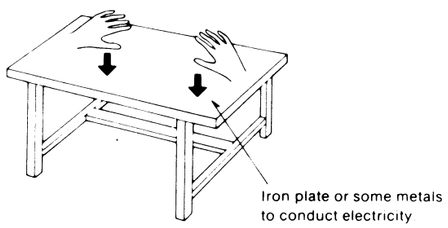


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



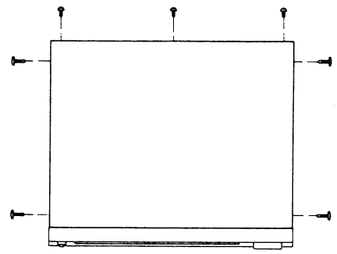


■ DISASSEMBLY INSTRUCTIONS

CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

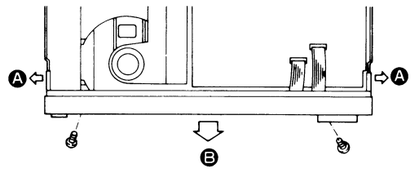
- **This unit uses FPC and care should be taken during assembly and disassembly.**

Ref. No. 1	How to remove the cabinet
Procedure 1	1. Remove the 7 screws.

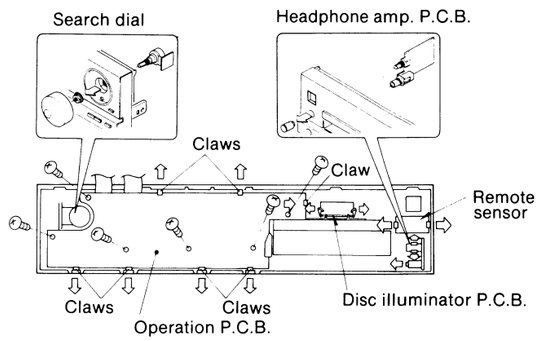


Note: When servicing, lock the lock shaft at the bottom of the unit. (See page 3.)

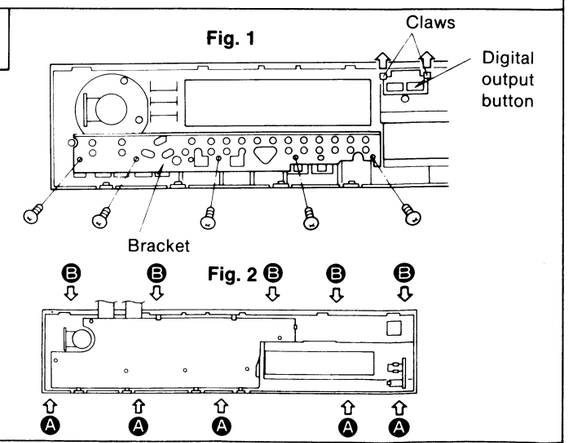
Ref. No. 2	How to remove the front panel
Procedure 1 ➧ 2	1. Remove the 2 screws. 2. Slightly pull the tabs outwards (arrows Ⓐ). 3. Remove the front panel in the direction of the arrow Ⓑ.



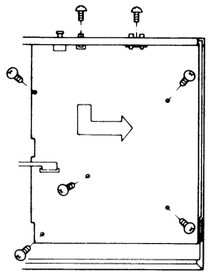
Ref. No. 3	How to remove the operation P.C.B., headphone amp. P.C.B., search dial, remote sensor and disc illuminator P.C.B.
Procedure 1 ➧ 2 ➧ 3	**A. Operation P.C.B.** 1. Remove the 6 screws. 2. Release the 7 claws. **B. Headphone amp. P.C.B.** 1. Pull out the level control knob. 2. Release the 3 claws. **C. Search dial** 1. Pull out the search dial. 2. Remove the nut. **D. Remote sensor** 1. Release the 2 claws. **E. Disc illuminator P.C.B.** 1. Release the 2 claws.

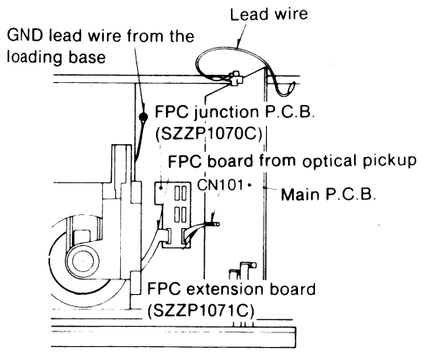


Ref. No. 4	How to remove the front grille and the operation buttons.
Procedure 1 ➧ 2 ➧ 3 ➧ 4	**A. Main operation button (Fig. 1)** 1. Remove the 5 screws. 2. Remove the bracket. **B. Digital output button (Fig. 1)** 1. Release the 2 claws. **C. Front grille (Fig. 2)** 1. First release the 5 claws Ⓐ at the bottom of the front panel. 2. Then release the 5 claws Ⓑ at the top of the front panel.



Ref. No. 5	How to remove the main P.C.B.
Procedure 1 ➧ 5	1. Remove the 7 screws. 2. Lift the P.C.B. to remove it from the chassis tab. 3. Remove the P.C.B. in the direction of the arrow.

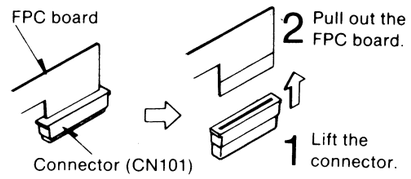




How to check the main P.C.B.

- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.

1. Remove the main P.C.B.
2. Remove the FPC board (CN101).



Caution: Insert the shorting pin into the FPC board in order to prevent breakdown of laser diode. (See page 15.)

3. Connect FPC board from optical pickup to FPC junction P.C.B. (SZZP1070C).

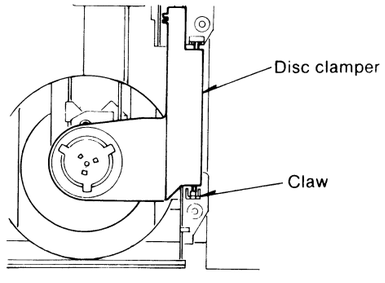
Caution: Cover the foil of the FPC junction P.C.B. with friction tape to prevent a short-circuit between the foil and the chassis.

4. Connect FPC extension board (SZZP1071C) to FPC junction P.C.B. and CN101 of the main P.C.B.
5. Place the main P.C.B. as shown in the figure.

Cautions:

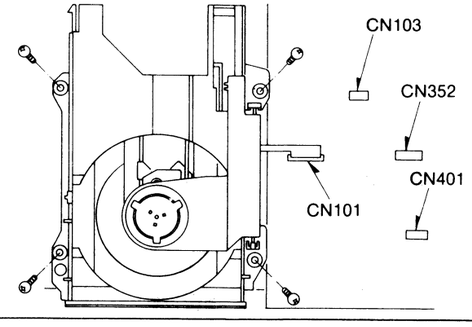
- Be sure to connect the P.C.B. ground terminal (line out terminal) and the chassis with a lead wire.
- Be sure to connect the GND lead wire from the loading base to the chassis.

Ref. No. 6	How to remove the disc clamper
Procedure 1 ➧ 6	• Release the claw.

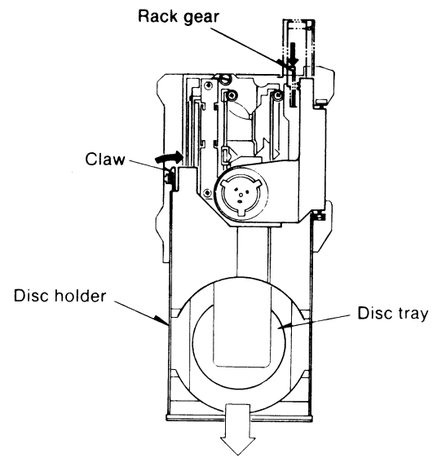


Ref. No. 7	How to remove the loading base
Procedure 1 ➧ 2 ➧ 7	1. Pull out the 3 connectors (CN103, CN352 and CN401). 2. Remove the FPC board (CN101). 3. Remove the 4 screws.

Refer to "HANDLING PRECAUTIONS FOR OPTICAL PICKUP" on page 15.

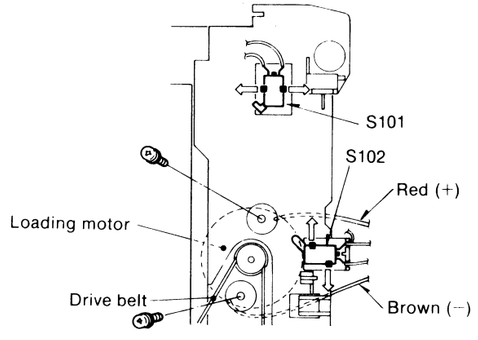


Ref. No. 8	How to remove the disc holder
Procedure 1 ➧ 2 ➧ 8	1. Push the rack gear slowly in the direction of the arrow until the disc tray comes up. 2. Pull the disc holder until it stops. 3. Release the claw. 4. Pull out the disc holder further to remove it.



Ref. No. 9	How to remove the loading motor
Procedure 1 ➧ 2 ➧ 7 ➧ 8 ➧ 9	1. Remote the drive belt. 2. Remove the 2 screws.

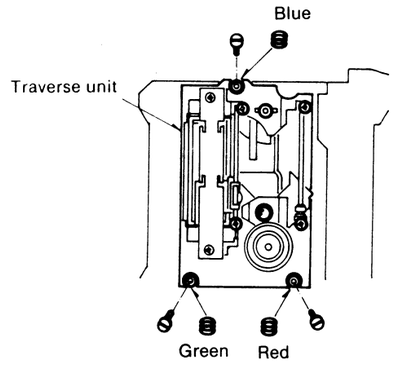
Note:
Red lead wire.....(+) terminal
(close to the slit of the motor)
Brown lead wire.....(−) terminal



How to remove the switches (S101, S102)

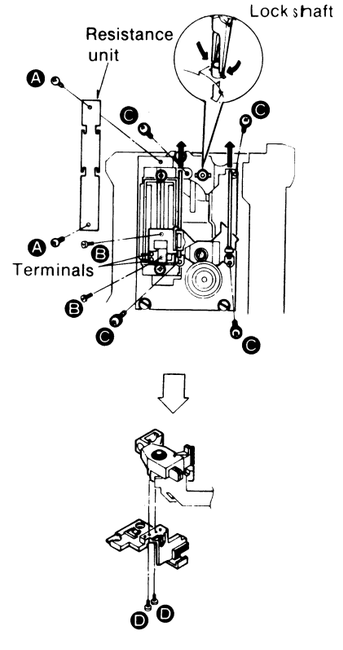
- Release the claws.
- Note the fitting direction before remove it.

Ref. No. 10	How to remove the traverse unit
Procedure 1 ➧ 2 ➧ 6 ➧ 7 ➧ 8 ➧ 10	• Remove the 3 screws.

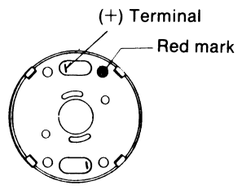


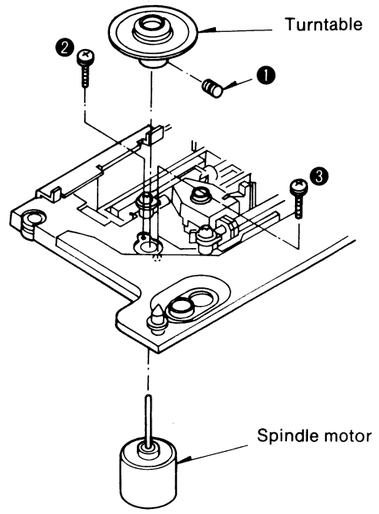
Caution: Note the color of the 3 springs, they must be reinstalled to their original positions.

Ref. No. 11	How to remove the optical pickup
Procedure 1 ➧ 2 ➧ 6 ➧ 7 ➧ 8 ➧ 11	1. Remove the 2 screws Ⓐ and the resistance unit. 2. Unsolder the 2 terminals and 2 screws Ⓑ. 3. Release the claws by using pliers to remove the lock shaft. 4. Remove the 4 screws Ⓒ. 5. Pull out the optical pickup from the 2 guide shafts. 6. Remove the 2 screws Ⓓ to separate the holder from the optical pickup.

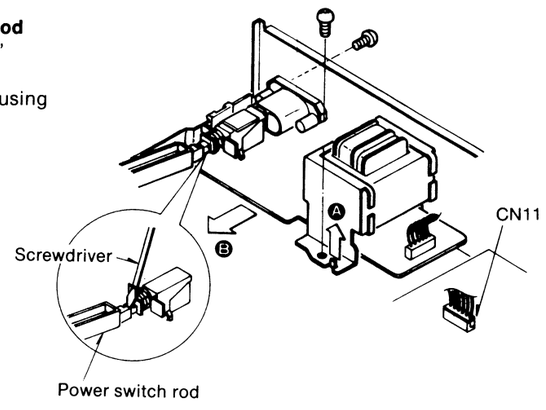


Ref. No. 12	How to remove the spindle motor
Procedure 1 ➧ 6 ➧ 7 ➧ 8 ➧ 12	1. Loosen the screw ❶ by using a 1.27 mm hexagonal wrench and remove the turntable. 2. Remove the 2 screws (❷, ❸). **Caution:** 1. Turntable height adjustment is necessary any time the turntable or spindle motor is replaced. 2. The (+) terminal of the spindle motor is indicated by the red mark.





Ref. No. 13	How to remove the power transformer
Procedure 1 ➧ 2 ➧ 8 ➧ 13	1. Remove the connector (CN11). 2. Remove the 2 screws. 3. Lift the power transformer to remove it from the chassis tab (arrow Ⓐ). 4. Remove the power source P.C.B. in the direction of arrow Ⓑ. **• How to remove the power switch rod** 1. Set the power switch in the "OFF" position. 2. Remove the power switch rod by using a screwdriver.

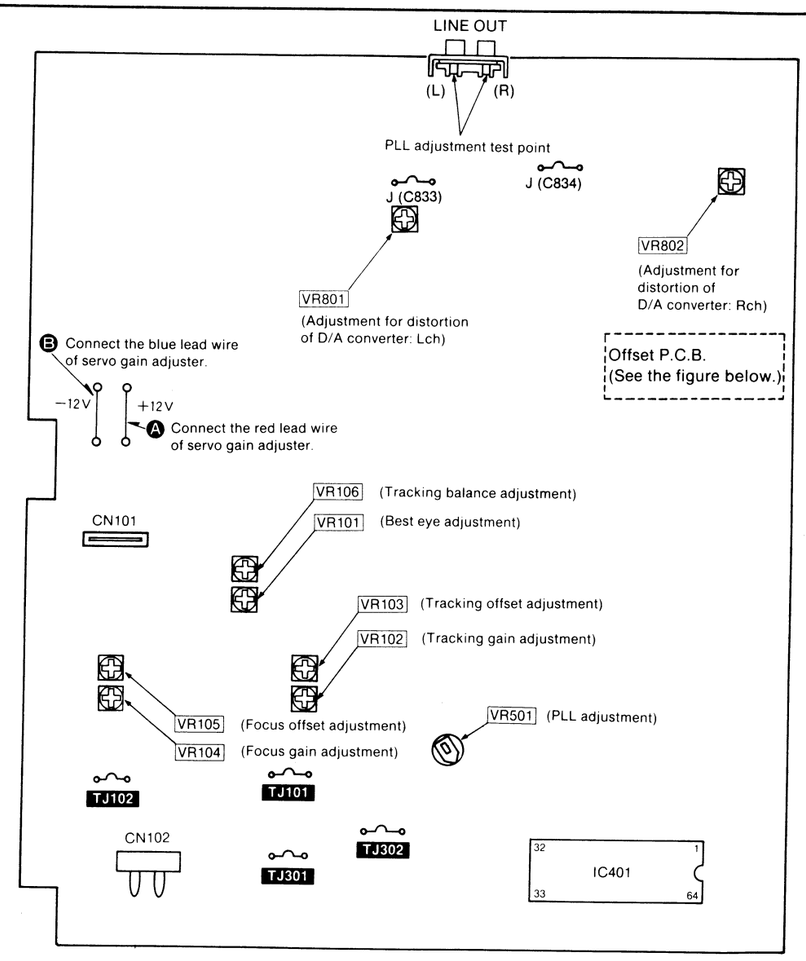


■ MEASUREMENTS AND ADJUSTMENTS

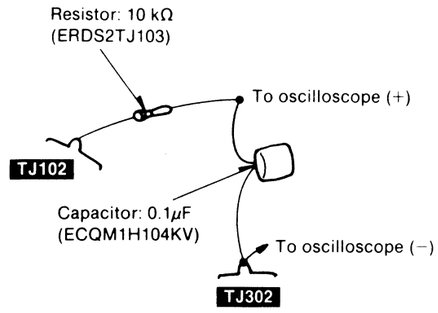
Caution:
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam , especially when performing adjustments.

ADJUSTMENT POINTS

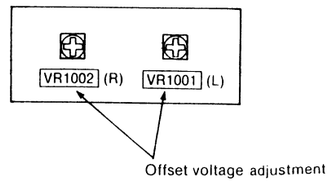
● Main P.C.B.



● Filter for turntable height adjustment



● Offset P.C.B.



ELECTRICAL ADJUSTMENT

Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
  Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector(SZZP1032F)

Adjustment Procedure

Step 1: Remove the cabinet. (Refer to page 16.)

Step 2: Make the temporary setting of each VR . (Refer to page 22.)

Step 3: Best eye (PD balance) adjustment. (Refer to page 22.)

Step 4: Connect the servo gain adjuster. (Refer to page 21.)

Step 5: Focus gain adjustment. (Refer to page 22.)

Step 6: Tracking gain adjustment. (Refer to page 22.)

Step 7: Focus offset adjustment (Refer to page 23.)

Step 8: Tracking offset adjustment. (Refer to page 23.)

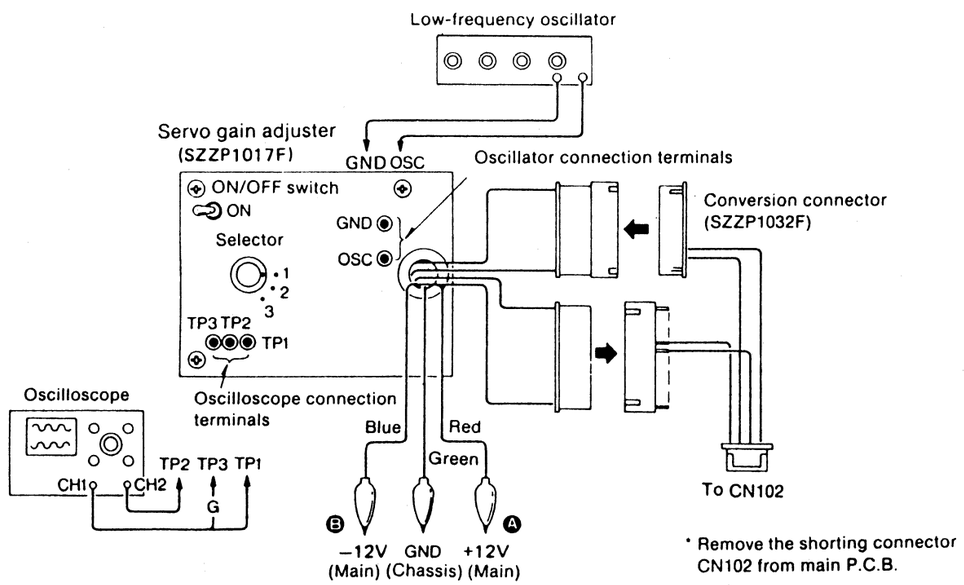
Step 9: Tracking offset balance adjustment. (Refer to page 23.)

Step 10: Disconnect the servo gain adjuster.

Step 11: PLL adjustment. (Refer to page 24.)

Step 12: Check of operation after adjustment. (Refer to page 24.)

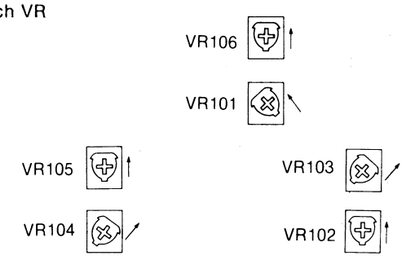
Connection of Servo Gain Adjuster



* Remove the shorting connector CN102 from main P.C.B.

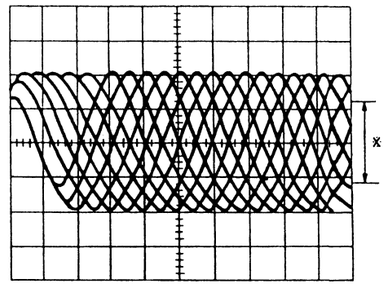
TEMPORARY SETTING OF EACH VR

Note :
If a disc skips or can not be played back , adjust each VR temporarily, as shown.



BEST EYE(PD BALANCE) ADJUSTMENT

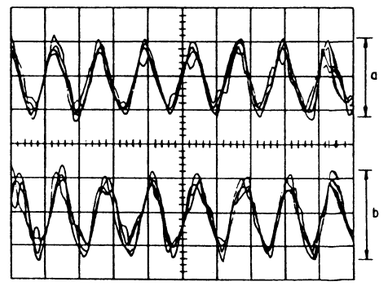
1. Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
   Oscilloscope setting: VOLT.....200mV
   SWEEP.....0.5µsec.
   INPUT.....AC
2. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
3. Set the player to the play mode.
4. Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum.
5. Turn **OFF** the power switch of the player.



*Most stretched eye pattern

FOCUS GAIN ADJUSTMENT

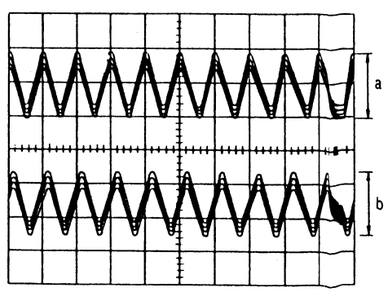
1. Connect the servo gain adjuster.(Refer to page 21.)
2. Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON.**
3. Set the low frequency oscillator to a frequency of **750Hz** and an output voltage of **100mVp-p.** Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
4. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster.(**TP3** is the ground terminal.)
   Oscilloscope setting: VOLT.....200mV(both channels)
   SWEEP.....1msec.
   INPUT.....DC
5. Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
6. Set the player to the play mode.
7. Set the selector switch of the servo gain adjuster from **"2" to "3".**
8. **750Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.
9. Shift the selector switch of the servo gain adjuster from **"3" to "2".**



* Make a=b

TRACKING GAIN ADJUSTMENT

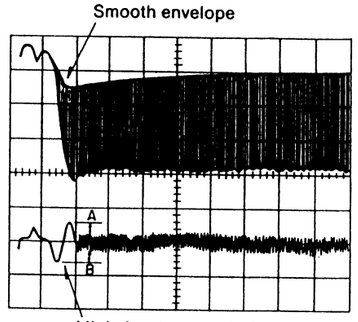
1. Oscilloscope setting and connection are same as above.
2. Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p.**
3. Set the selector switch of the servo gain adjuster from **"2" to "1".**
4. **1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.
5. Shift the selector switch of the servo gain adjuster from **"1" to "2".**
6. Turn **OFF** the power switch of the player.



*Make a=b

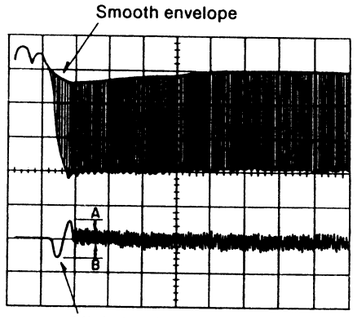
FOCUS OFFSET ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ102** (+) and **TJ302** (-)of the main P.C.B.
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105**, so that the waveform around the triggering point becomes as shown in the illustration.



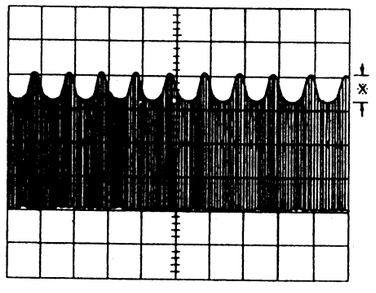
TRACKING OFFSET ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ101** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103**, so that the waveform around the triggering point becomes as shown in the illustration.



TRACKING OFFSET BALANCE ADJUSTMENT

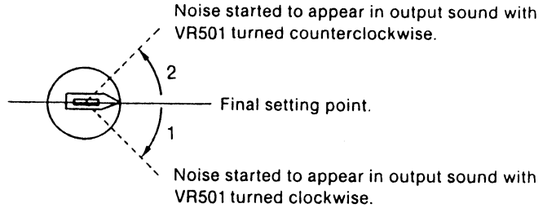
1.Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
2.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-)of the main P.C.B.
Oscilloscope setting:VOLT.....500 mV
SWEEP.....0.5msec.
INPUT.....AC
3.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
4.Set the player to the play mode.
5.Set the selector switch of the servo gain adjuster from **"2"** to **"1"**.
6.Adjust **VR106**, so that the output waveform is as shown (jitter is minimized).
7.Shift the selector switch of the servo gain adjuster from **"1"** to **"2"**.
8.Turn **OFF** the power switch of the player.
9.Disconnect the servo gain adjuster, and insert the shorting connector of CN102 to the original position.



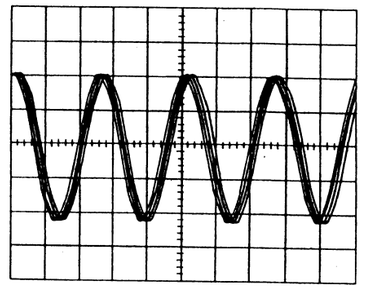
*Jitter should be minimized.

PLL ADJUSTMENT

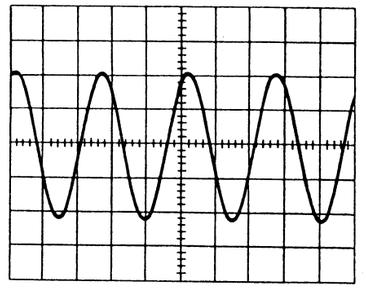
1.Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground.**
Oscilloscope setting:VOLT.....1V
SWEEP.....1msec.
INPUT.....DC
2.Turn **ON** the power switch of the player and insert the test disc(SZZP1054C).
3.Play **Track No.6 (wedge 0.7mm)** of the test disc.
4.Check the waveform displayed on the oscilloscope and adjust **VR501** in the following steps.
Step 1. Turn **VR501** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 2. Turn **VR501** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 3. Set **VR501** in the middle between the points observed in the above steps " 1 " and " 2 " .


Noise started to appear in output sound with VR501 turned counterclockwise.
2
Final setting point.
1
Noise started to appear in output sound with VR501 turned clockwise.

• NG



• OK



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

Check of skip search
1.Play an ordinary disc.
2.Press the skip button and verify skip search operation (forward and reverse).

Check of manual search
1.Play an ordinary disc.
2.Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

Check of playability
1.Play the test disc (SZZP1054C).
2.Play the track No.6 (wedge 0.7mm) and verify that there is no skip sound or noise.
3.Play the track No.13 (black dot 0.7mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT

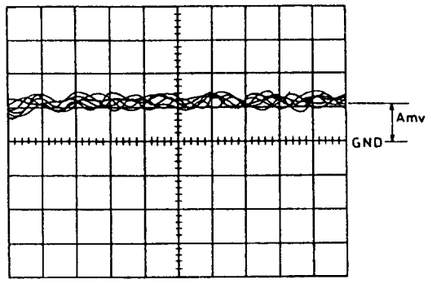
Measuring Instruments and Special Tools
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- Hexagonal wrench (SZZP1044C....1.5mm)
- Screw lock paint (RZZ0L01)
- Hexagonal wrench (1.27mm)
- Feeler gauge (RZZ0297)
- Filter (Refer to page 20.)

Adjustment Procedure
- If the optical pickup and spindle motor are replaced , adjust it according to the following procedure.

Step 1: Make the temporary of each VR. (Refer to page 22.)
↓
Step 2: Turntable height adjustment. (Refer to page 25.)
↓
Step 3: Mechanical adjustment. (Refer to page 25.)
↓
Step 4: Electrical adjustment. (Refer to page 21.)

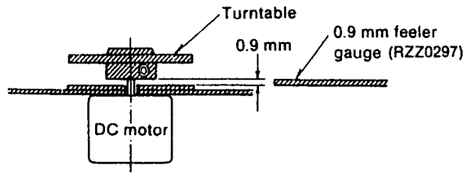
TURNTABLE HEIGHT ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ102** (+) and **TJ302** (-) of the main P.C.B.through the filter.(Refer to page 20.)
Oscilloscope setting:VOLT.....50mV
SWEEP.....1msec.
INPUT.....DC
2.Set the oscilloscope to DC zero balance.
3.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
4.Set the player to the play mode.
5.Measure the DC level (AmV) displayed on the oscilloscope.
If the value of A is within the range of ± 60mV , the turntable height is correct. If it is not within this range , make the necessary adjustments using the 0.9mm feeler gauge (RZZ0297). If A is more than +60mV , make the turntable lower. If A is less than -60mV , make the turntable higher.



Adjust the turntable height as follow:

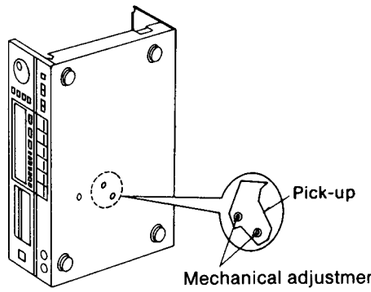
A.Insert the 0.9mm feeler gauge(RZZ0297) as shown below.



B.Loosen the turntable set-screw.
C.Adjust the turntable height to 0.9 mm with the feeler gauge as shown above.
D.Tighten the turntable set-screw by using the 1.27mm hexagonal wrench.
E.Check the turntable height adjustment by following steps 1 ~ 5 above.

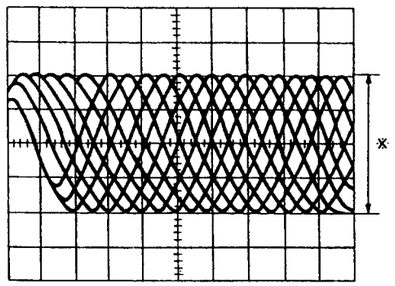
MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1056C).
3.Using the manual search buttons , move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.



Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

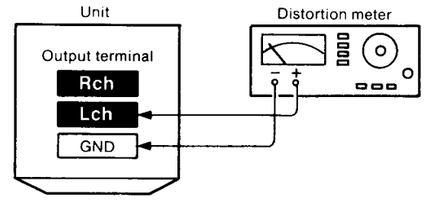
4.Monitoring RF signal on the oscilloscope, adjust **the two adjusting screws** alternatelywith the 1.5mm hexagonal wrench (SZZP1044C) so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.



ADJUSTMENT FOR DISTORTION OF D/A CONVERTER

Measuring Instruments and Special Tools
- Distortion meter
- Test disc
  Test disc (SZZP1014F) old or new type

1. Connect (+) terminal of the distortion meter to output terminal (Lch or Rch) and (−) terminal to the chassis.
2. Turn ON the power switch of the player and insert the test disc (SZZP1014F).
3. Playback 1 kHz, −24 dB signal.
4. Adjust VR801 (Lch) or VR802 (Rch) so that the distortion ratio is minimized.



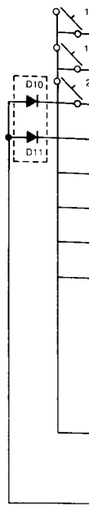
OFFSET VOLTAGE ADJUSTMENT

Measuring Instrument
- Digital voltmeter

1. Press "STOP" button and set the player in "STOP MODE".
2. Connect the digital voltmeter to jumper wire mounted in J (C833) (Lch) (+) or J (C834) (Rch) (+) and output terminal (GND) (−).
3. Adjust VR1001 (Lch) or VR1002 (Rch) so that the voltage is ±1 mV.

■ SCH

- Scher



- Key nu

Z0297) as shown

0.9 mm feeler
gauge (RZZ0297)

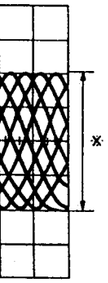
ith the feeler gauge

using the 1.27mm

nent by following

ope, adjust **the two**
1.5mm hexagonal
tical fluctuation of
e pattern is most

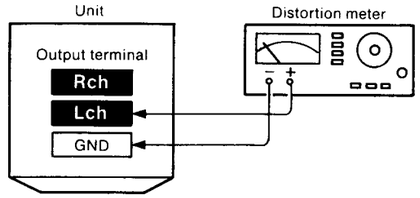
yer.
ck paint(RZZ0L01)



ADJUSTMENT FOR DISTORTION OF D/A CONVERTER

Measuring Instruments and Special Tools
- Distortion meter
- Test disc
  Test disc (SZZP1014F) old or new type

1. Connect (+) terminal of the distortion meter to output terminal (Lch or Rch) and (−) terminal to the chassis.
2. Turn ON the power switch of the player and insert the test disc (SZZP1014F).
3. Playback 1 kHz, −24 dB signal.
4. Adjust VR801 (Lch) or VR802 (Rch) so that the distortion ratio is minimized.



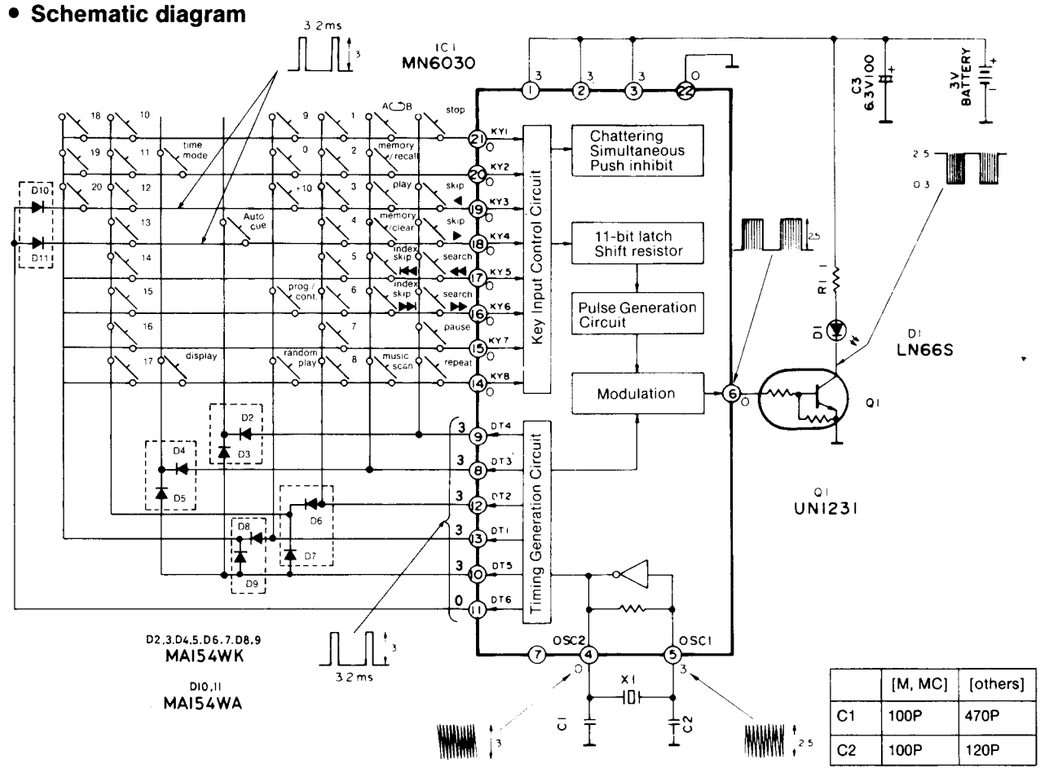
OFFSET VOLTAGE ADJUSTMENT

Measuring Instrument
- Digital voltmeter

1. Press "STOP" button and set the player in "STOP MODE".
2. Connect the digital voltmeter to jumper wire mounted in J (C833) (Lch) (+) or J (C834) (Rch) (+) and output terminal (GND) (−).
3. Adjust VR1001 (Lch) or VR1002 (Rch) so that the voltage is ±1 mV.

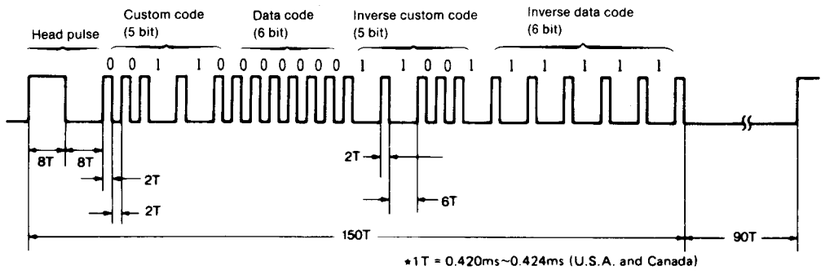
■ SCHEMATIC DIAGRAM OF REMOTE CONTROL UNIT

• Schematic diagram

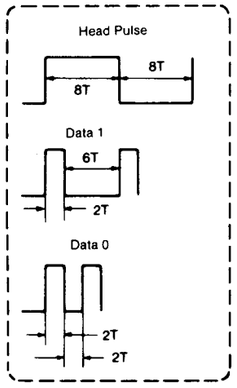


	[M, MC]	[others]
C1	100P	470P
C2	100P	120P

• Key number description and data code



*1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)



Function	Data Code
stop	0 0 0 0 0 0
skip ⏮	0 1 0 0 0 0
skip ⏭	1 1 0 0 0 0
search ◀◀	0 0 1 0 0 0
search ▶▶	1 0 1 0 0 0
pause	0 1 1 0 0 0
repeat	1 1 1 0 0 0
A-B repeat	0 0 0 1 0 0
memory recall	1 0 0 1 0 0
play	0 1 0 1 0 0
memory clear	1 1 0 1 0 0
index skip ⏮◀◀	0 0 1 1 0 0
index skip ▶▶⏭	1 0 1 1 0 0
music scan	1 1 1 1 0 0

Function	Data Code
1	0 0 0 0 1 0
2	1 0 0 0 1 0
3	0 1 0 0 1 0
4	1 1 0 0 1 0
5	0 0 1 0 1 0
6	1 0 1 0 1 0
7	0 1 1 0 1 0
8	1 1 1 0 1 0
9	0 0 0 1 1 0
0	1 0 0 1 1 0
·10	0 1 0 1 1 0
program/ continue	1 0 1 1 1 0
random play	1 1 1 1 1 0

Function	Data Code
auto cue	1 1 0 0 0 1
time mode	1 0 0 1 0 1
display	1 1 1 1 0 1
10	0 0 0 0 1 1
11	1 0 0 0 1 1
12	0 1 0 0 1 1
13	1 1 0 0 1 1
14	0 0 1 0 1 1
15	1 0 1 0 1 1
16	0 1 1 0 1 1
17	1 1 1 0 1 1
18	0 0 0 1 1 1
19	1 0 0 1 1 1
20	0 1 0 1 1 1

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

Notes:

1. **S1** : Power switch in "**on**" position.
2. **S2** : Voltage selector switch. (For [EK], [XA], [XB], [PA], [PE] and [PC] only.)
3. **S101** : Disc holder open/close detection switch.
4. **S102** : Disc holder open/close detection switch.
5. **S601** : Open/close switch.
6. **S602** : Stop switch.
7. **S603** : Pause switch.
8. **S604** : Play switch.
9. **S605** : Program switch.
10. **S606** : Recall switch.
11. **S607** : Time mode switch.
12. **S608** : Music scan switch.
13. **S609** : Side A-B switch.
14. **S611~615, S621~625, S631~635, S641~645** : Numeric (1~20) switches.
15. **S616** : Clear switch.
16. **S617** : Forward skip switch.
17. **S619** : Edit switch.
18. **S626** : Numeric (0) switch.
19. **S627** : Backward skip switch.
20. **S629** : A-B peak level search switch.
21. **S636** : Numeric (+10) switch.
22. **S637** : Forward index skip switch.
23. **S638** : A-B repeat switch.
24. **S639** : Peak level search switch.
25. **S647** : Backward index skip switch.
26. **S648** : Repeat switch.
27. **S649** : Display mode selector switch.
28. **S651** : Timer switch.
29. **S653** : Digital output switch.
30. **S654** : Random play switch.
31. **S655** : Auto cue switch.
32. **S656** : Search speed selector switch.
33. The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1 kHz, L+R, 0 dB), others are voltage values in stop mode.
25. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
26. ——— : Positive voltage lines and negative voltage lines.
    ⋯⋯ : Audio signal lines.

Caution!

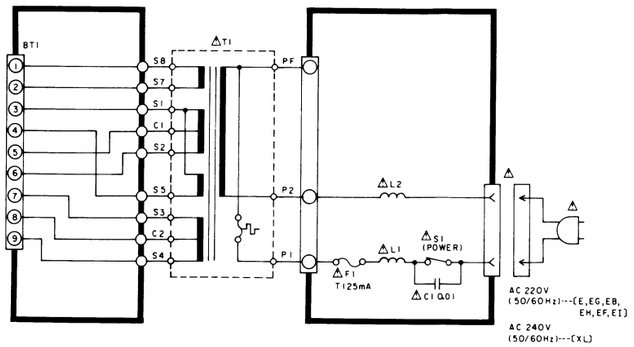
IC and LSI are aensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.

1 2 3 4 5 6 7 8

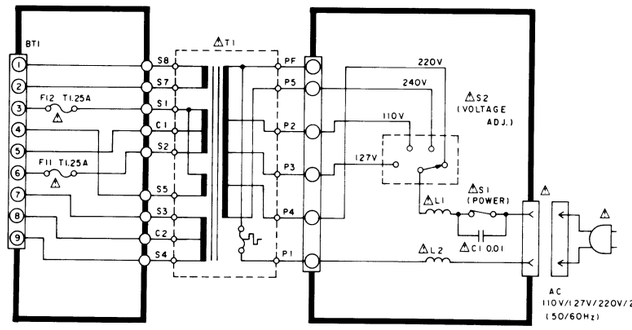
A B C D E F

G POWER SOURCE CIRCUIT

- **For [E], [EG], [EB], [EH], [EF], [Ei], and [XL] areas**

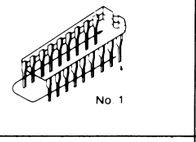


- **For [EK], [XA], [XB], [PA], [PE] and [PC] areas**

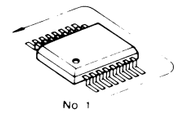


- **Terminal guide of IC's, Transistors and Diodes**

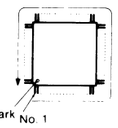
MN15283PEE MN1554PEF	64 pin
AN6873N	18 pin
PCM56P-J PCM56P YM3404B	16 pin
MN74HC00	14 pin



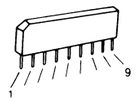
AN8370 AN8371	42 pin 24 pin
SVICXK5816M SVIUPD4053G1	16 pin
MN74HC00 AN6554NS	14 pin
MN6636S SVIM5238 SVINJM5532 SVIM5219 AN6552S	10 pin 8 pin



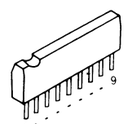
MN6622 ..... 84 pin
MN53010PEH ..... 42 pin



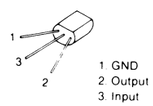
SVINJM4556SA



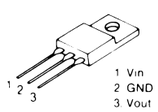
SVIBA6218



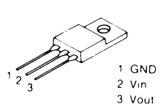
AN79L12



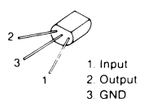
LM2940T5
M5F78M08L



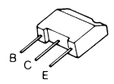
M5F79M08



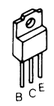
AN78L12



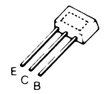
2SB1240
2SB1238
2SC4010
2SD1862



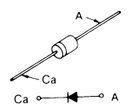
2SB941
2SD1266



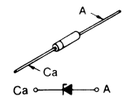
2SD1330 UN4112
2SC3311 UN4114
UN4211



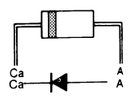
MA165



MA4033 MA4091
MA4082 SVDMTZ33
MA723

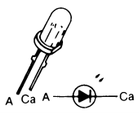


SVD1S35200A

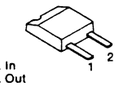


SVDRDF02M

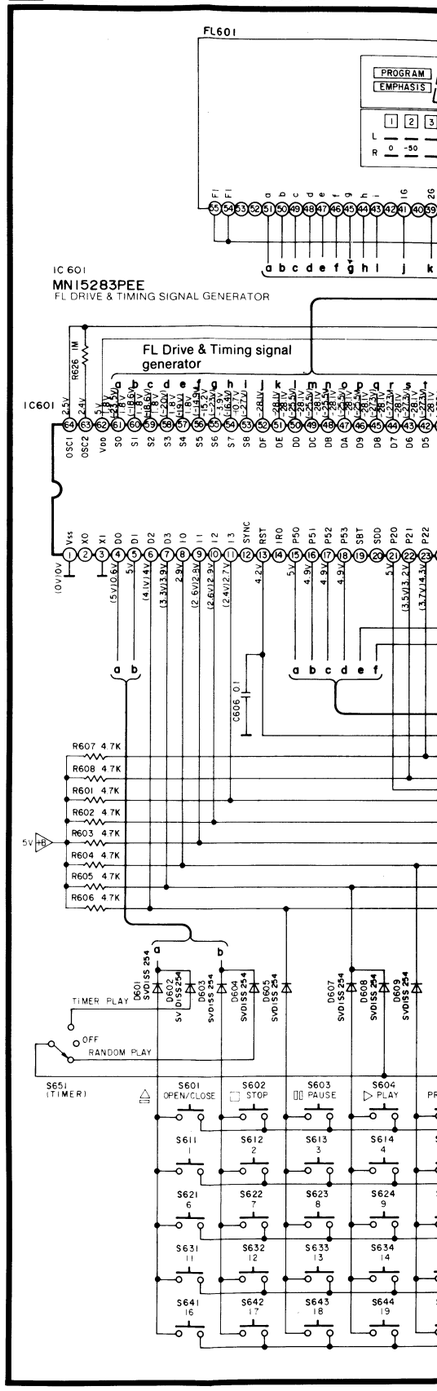
SVGDPG7851Y
SVGDAY7851
SVDSLR54MW4



SRUN5
SRUN15

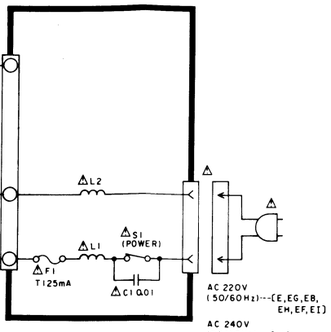


C OPERATION CIRCUIT

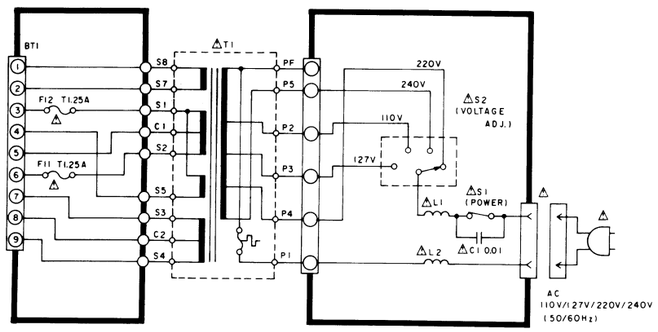


RCUIT

[EF], [Ei], and [XL] areas

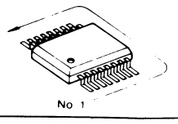


- **For [EK], [XA], [XB], [PA], [PE] and [PC] areas**

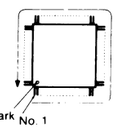


Transistors and Diodes

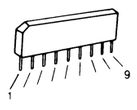
AN8370	42 pin
AN8371	24 pin
SVICXK5816M	
SVIUPD4053G1	16 pin
MN74HC00	14 pin
AN6554NS	
MN6636S	10 pin
SVIM5238	8 pin
SVINJM5532	
SVIM5219	
AN6552S	



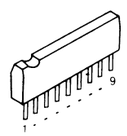
MN6622 ..... 84 pin
MN53010PEH ..... 42 pin



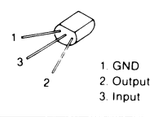
SVINJM4556SA



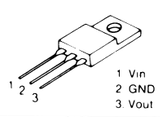
SVIBA6218



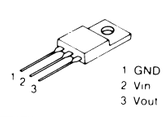
AN79L12



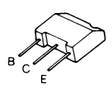
LM2940T5
M5F78M08L



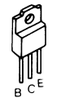
M5F79M08



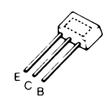
2SB1240
2SB1238
2SC4010
2SD1862



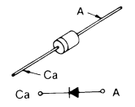
2SB941
2SD1266



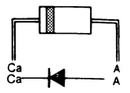
2SD1330 UN4112
2SC3311 UN4114
UN4211



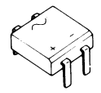
MA165



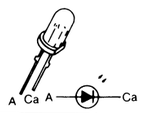
SVD1S35200A



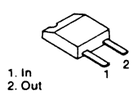
SVDRDF02M



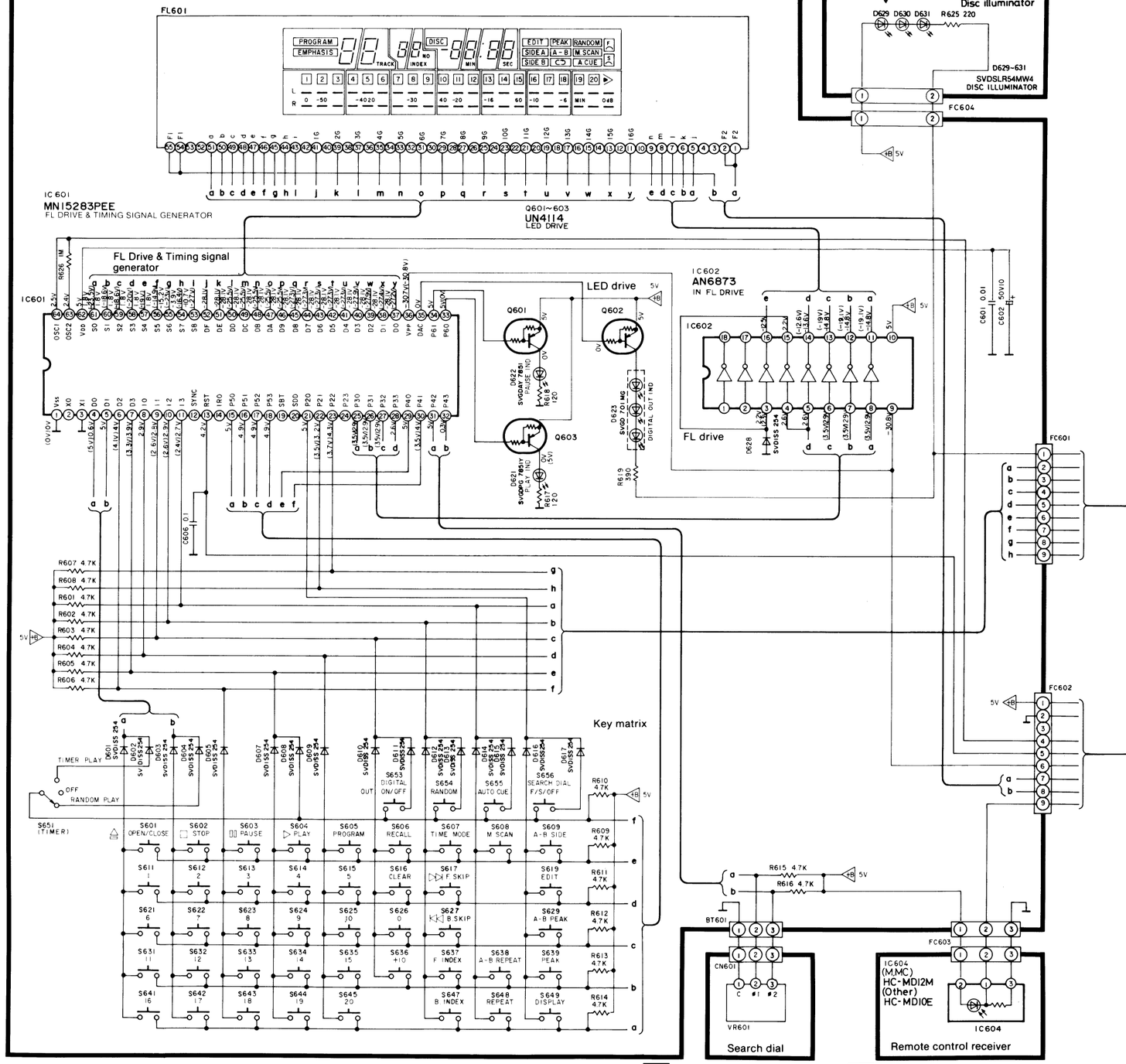
SVGDPG7851Y
SVGDAY7851
SVDSLR54MW4



SRUN5
SRUN15



C OPERATION CIRCUIT



E DISC ILLUMINATOR CIRCUIT

B SEARCH DIAL CIRCUIT

F REMOTE SENSOR CIRCU

A MAIN CIRCUIT

LOADING MOTOR

OPEN/CLOSE DETECTION

Loading motor drive

IC402 BA6218 MOTOR DRIVE

DRIVE

DIRECTION SELECT

SPEED POSITION SENSOR

OPTICAL PICKUP

IC401 MN1554PEF SYSTEM CONTROL

System control

Focus servo

Tracking servo

IC104,105 AN6552S FOCUS COIL/ TRACKING COIL DRIVE

Traverse servo

Q141,161 2SD1862 FOCUS COIL/ TRACKING COIL DRIVE

Q142,162 2SB1240 FOCUS COIL/ TRACKING COIL DRIVE

Q181 2SD1266 TRAVERSE COIL DRIVE

Q182 2SB941 TRAVERSE COIL DRIVE

IC102 MN6636S SWITCHING

IC101 AN8370S OPTICAL SERVO

Q101 2SC4010 AUTO POWER CONTROL

Optical servo

Best eye (PD balance adj.)

Tracking offset balance adj

Tracking offset adj

Focus offset adj

Focus gain adj

Tracking gain adj

Q501 DTAI24 SWITCHING

IC501 AN8377 DATA SL

Data slice and PLL

PLL adj

IC306 T0TX172 OPTICAL TRANSMISSION MODULE

Optical transmitter

IC304 MN74HC00S NAND GATE

COAXIAL

RESET SIGNAL GENERATOR

Q401,402 2SC3311 RESET SIGNAL GENERATOR

Q352 2SD1862 MOTOR DRIVE

IC 12 BA4558FI MOTOR DRIVE

Q351 UN4112 MOTOR DRIVE

SPINDLE MOTOR

Q353 2SB1240 MOTOR DRIVE

IC301 MN6622 E.F.M DECODER ERROR CORRECTION & CLV SERVO

IC303 CXK5 16K R

16K RAM

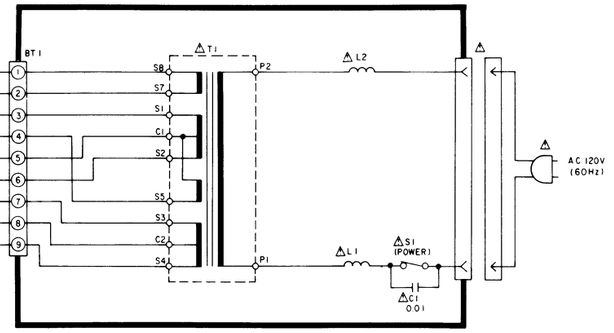
Best eye (PD balance adj.)
CN102
Tracking offset balance adj
IC101 AN8370S OPTICAL SERVO
Q101 2SC4010 AUTO POWER CONTROL
Tracking gain adj
Optical servo
IC105
Q501 DTA124 SWITCHING
IC501 AN8371S DATA SLICE & PLL.
Data slice and PLL
PLL adj
IC14 AN79L12 REGULATOR
IC13 AN78L12 REGULATOR
Regulator
Q15 2SD1266 REGULATOR
Q16 2SB941 REGULATOR
Q17 2SB1238 REGULATOR
IC11 LM2940T5 REGULATOR
IC12 BA4558FI REGULATOR
Q12 2SB941 REGULATOR
D15~18 SVDISR35200V
ICP3,4,5 SRUN15-- --For(EK) area
Rectifire D11~14 SVDISR35200V
IC801~803 PCM56P-J D/A CONVERTER
IC802,804 PCM56P D/A CONVERTER
D61~64 SVDISS254
Digital signal processing
IC301 MN6622 E.F.M DECODER ERROR CORRECTION & CLV SERVO
IC302 YM3404B DIGITAL FILTER
Digital filter
IC305 MN53010PEH DIGITAL FILTER
Serial/Parallel Converter
IC303 CXK5816M 16K RAM
16K RAM
Q810 UN4211 MUTING CONT.
D/A Converter distortion adj Lch
D/A Converter distortion adj Rch
IC809,810 NJM5532M BUFFER AMP
IC811,812 NJM5532M L.P.F.
IC815,816 μPD4053G1 SWITCHING
D/A Converter
Filter
Q352 2SD1862 MOTOR DRIVE
IC 12 BA4558FI MOTOR DRIVE
Q351 UN4112 MOTOR DRIVE
Q353 2SB1240 MOTOR DRIVE
SPINDLE MOTOR
CN351

24 25 26 27 28 29 30 31 32 33 34

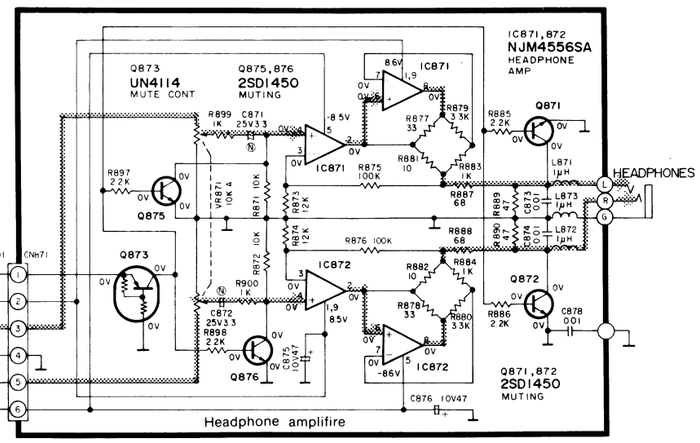
G POWER SOURCE CIRCUIT

- **For [M] and [MC] areas**

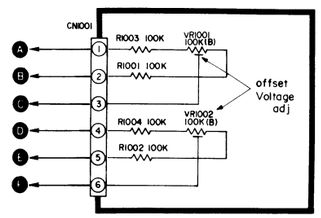
(For other areas, refer to page 28.)



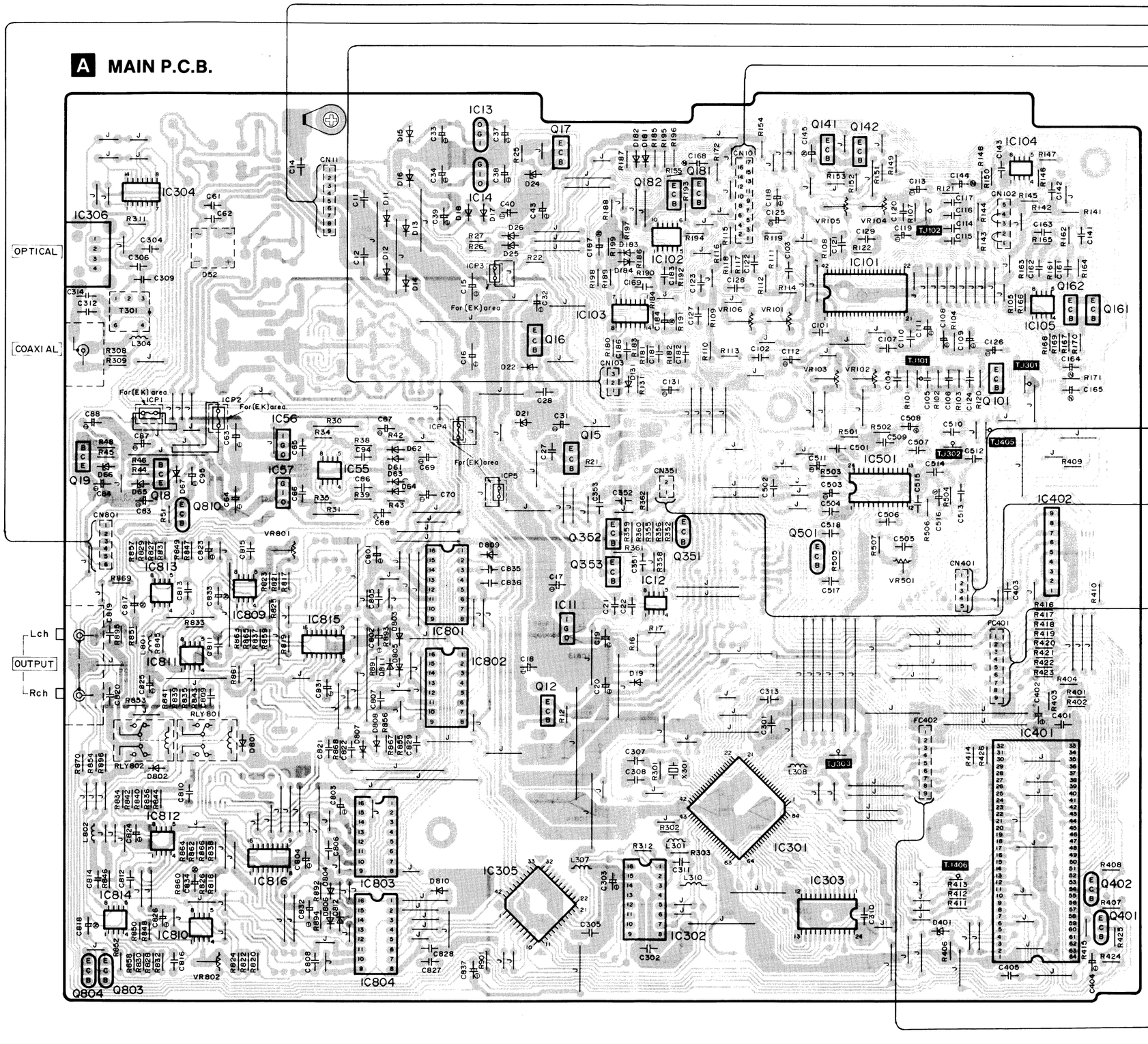
B HEADPHONE AMP. CIRCUIT

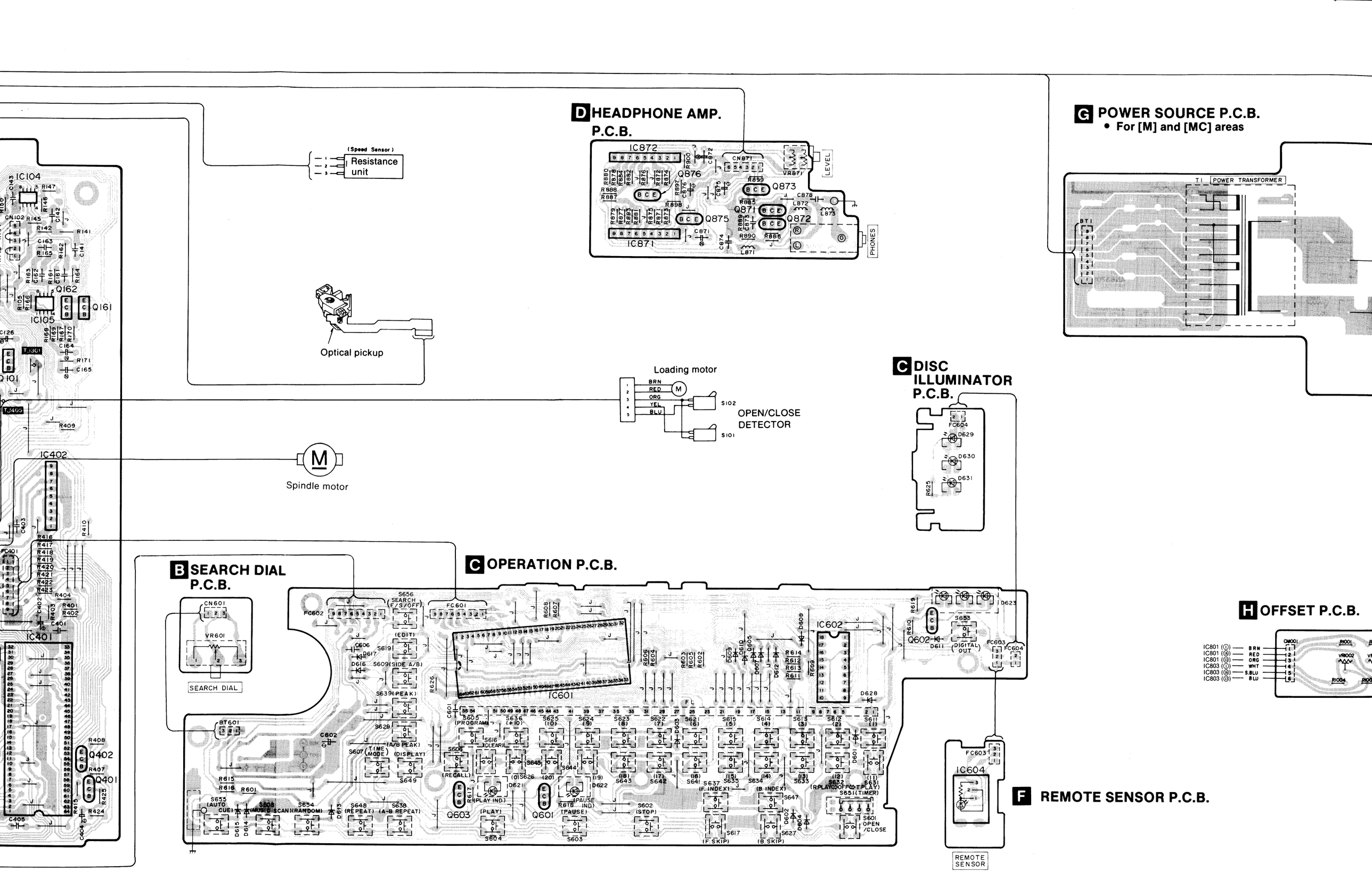


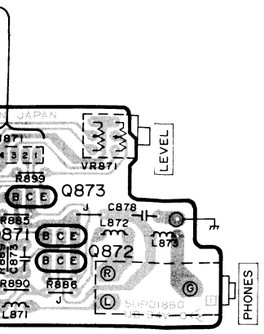
H OFFSET CIRCUIT



■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

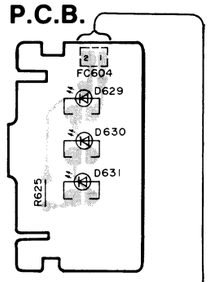


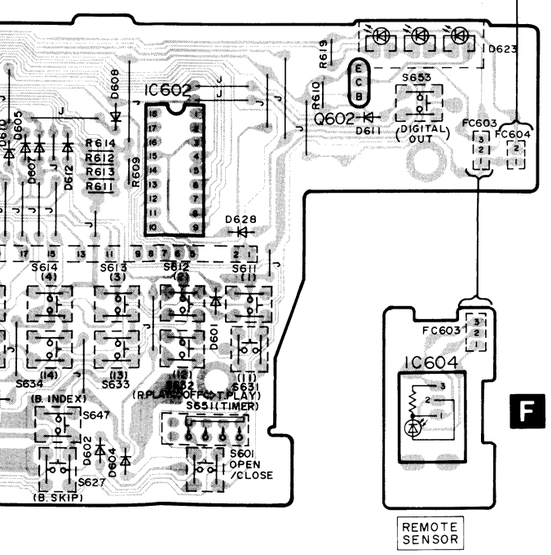

(Speed Sensor)
Resistance unit
Optical pickup
Loading motor
BRN
RED
ORG
YEL
BLU
S102
S101
OPEN/CLOSE DETECTOR
Spindle motor
D HEADPHONE AMP. P.C.B.
IC872
IC871
Q876
Q873
Q871
Q872
Q875
VR871
LEVEL
PHONES
G POWER SOURCE P.C.B.
• For [M] and [MC] areas
T1 POWER TRANSFORMER
BT1
C DISC ILLUMINATOR P.C.B.
FC604
D629
D630
D631
R625
B SEARCH DIAL P.C.B.
CN601
VR601
SEARCH DIAL
C OPERATION P.C.B.
IC601
IC602
IC604
Q601
Q602
Q603
S656 SEARCH (F/S/OFF)
S619 (EDIT)
S609 (SIDE A/B)
S639 (PEAK)
S628
S607 (TIME MODE)
S649 (A/B PEAK)
(DISPLAY)
S605 (PROGRAM)
S636 (+10)
S625 (10)
S624 (9)
S623 (8)
S622 (7)
S621 (6)
S615 (5)
S614 (4)
S613 (3)
S612 (2)
S611 (1)
S616 (CLEAR)
S606 (RECALL)
S645
S644
S643
S642
S641
S637 (F. INDEX)
S635
S634 (B. INDEX)
S633 (R.PLAY/S652 F.PLAY)
S651 (TIMER)
S647
S655 (AUTO CUE)
S608 (MUSIC SCAN)
S654 (RANDOM)
S648 (REPEAT)
S638 (A-B REPEAT)
S604 (PLAY)
S603 (PAUSE)
S602 (STOP)
S617 (F. SKIP)
S627 (B. SKIP)
S601 OPEN /CLOSE
S653 (DIGITAL OUT)
D623
D628
D621 (PLAY IND.)
D622 (PAUSE IND.)
R618
R617
R626
C601
C602
BT601
F REMOTE SENSOR P.C.B.
REMOTE SENSOR
H OFFSET P.C.B.
IC801 (O)
IC801 (G)
IC801 (O)
IC803 (O)
IC803 (G)
IC803 (G)
BRN
RED
ORG
WHT
S.BLU
BLU
CN001
R1001
VR1002
R1004
IC104
IC105
IC402
IC401
Q162
Q161
Q101
Q402
Q401
TJ301
TJ405
CN102
FC401
FC602
FC601
FC603
FC604
R408
R407
R424
R423
R415
C405
C404
C403
C402
C401
R410
R409
R404
R401
R402
R147
R146
R145
R142
R141
C143
C142
C141
C163
C162
C161
R163
R162
R161
R164
R165
R166
R105
C126
R169
R168
R167
R170
C164
C165
R171



OPEN/CLOSE
DETECTOR

C DISC ILLUMINATOR P.C.B.

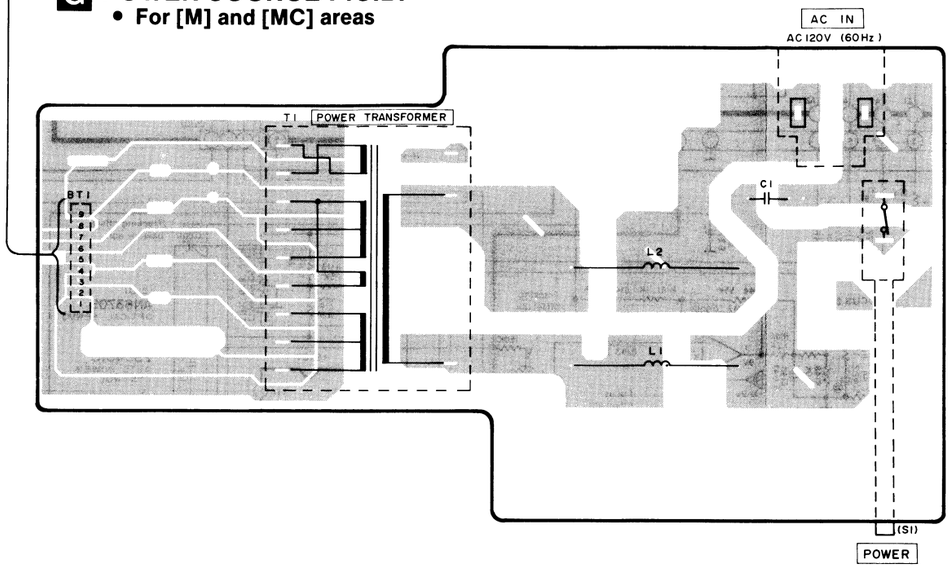




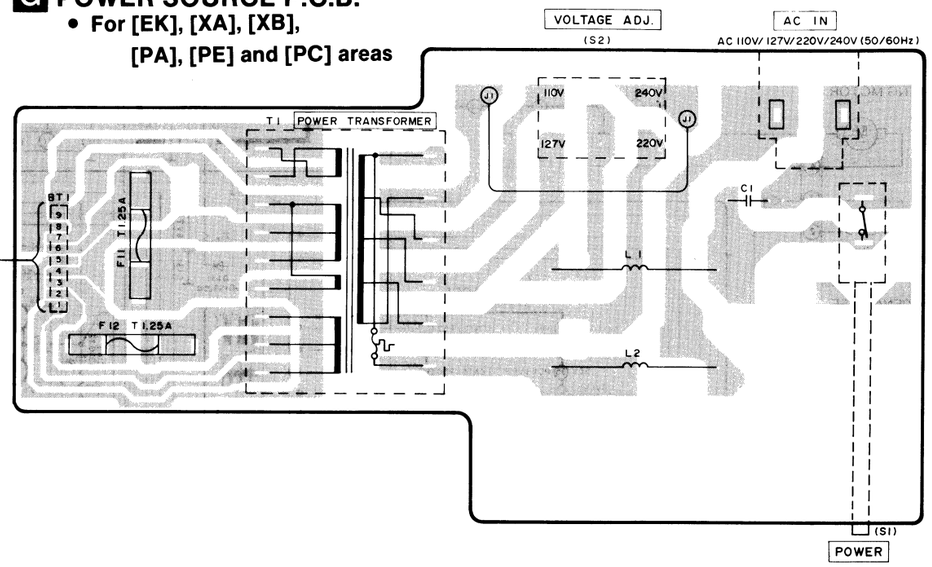
REMOTE SENSOR

F REMOTE SENSOR P.C.B.

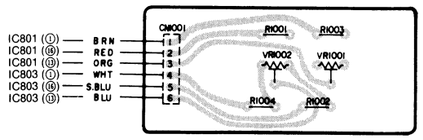
G POWER SOURCE P.C.B.
- For [M] and [MC] areas



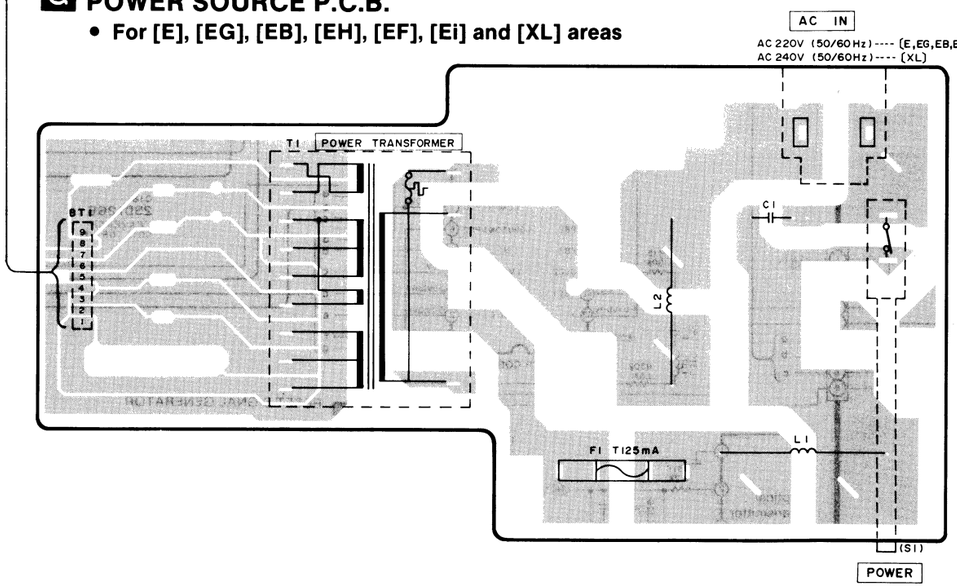
G POWER SOURCE P.C.B.
- For [EK], [XA], [XB], [PA], [PE] and [PC] areas



H OFFSET P.C.B.



G POWER SOURCE P.C.B.
- For [E], [EG], [EB], [EH], [EF], [Ei] and [XL] areas



■ REPLACEMENT PARTS LIST (Electric parts)

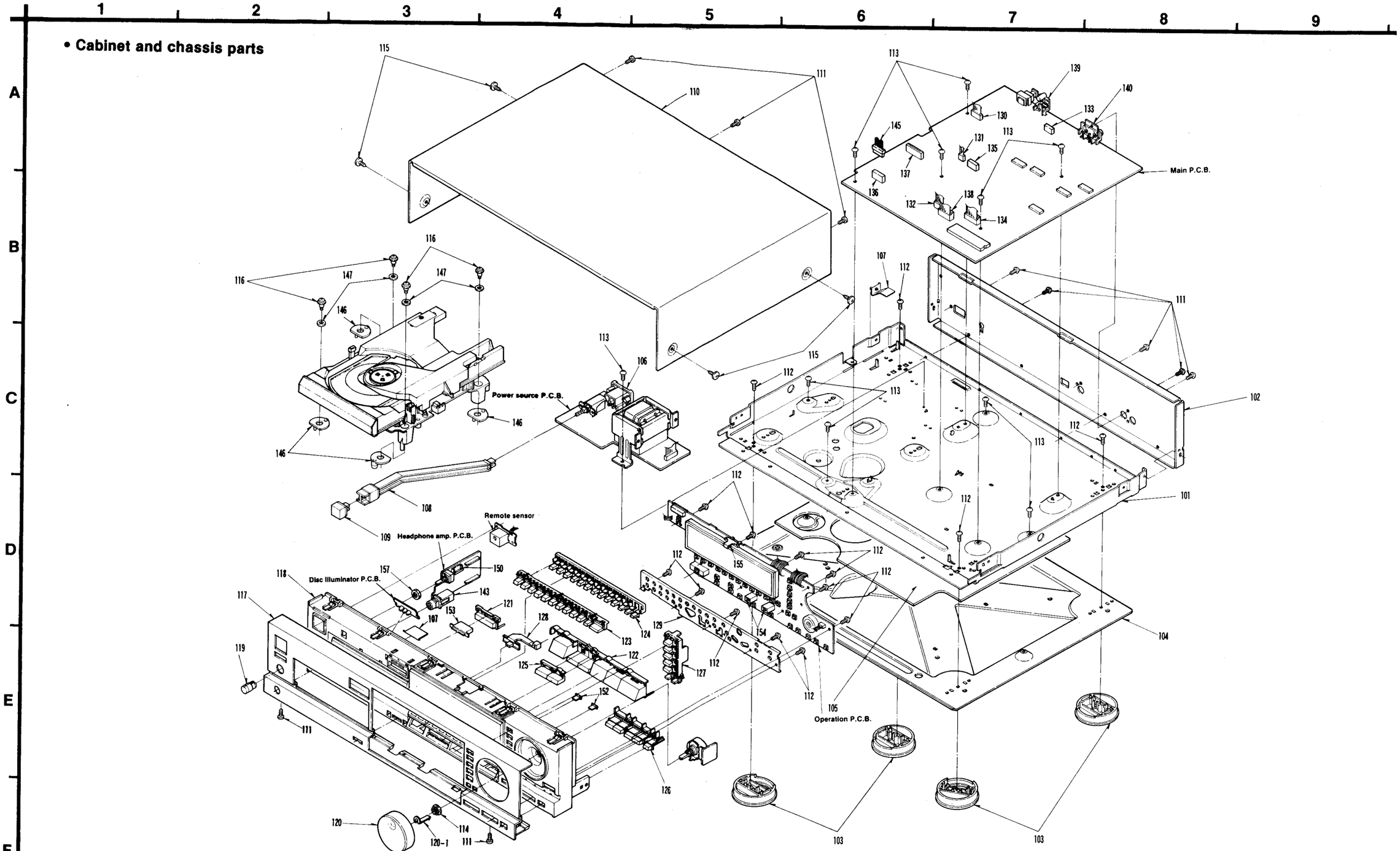
Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.
* Remote Control Ass'y:
Supply period for three years from termination of production.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC11	LM2940T5	I.C. REGULATOR
IC12	AN6552S	I.C. REGULATOR
IC13	AN78L12	I.C. REGULATOR
IC14	AN79L12	I.C. REGULATOR
IC55	SVIM5219FP	I.C. REGULATOR
IC56	M5F78M08L	I.C. REGULATOR
IC57	M5F79M08L	I.C. REGULATOR
IC101	AN8370S	I.C. OPTICAL SERVO
IC102	MN6636S	I.C. DEGLITCH
IC103	AN6554NS	I.C. REGULATOR
IC104	AN6552S	I.C. REGULATOR
IC105	AN6552S	I.C. REGULATOR
IC301	MN6622	I.C. SIGNAL PROCESSING
IC302	YM3404B	I.C. DIGITAL FILTER
IC303	SVICXK5816M	I.C. 16K RAM
IC304	MN74HC00S	I.C. NAND GATE
IC305	MN53010PEH	I.C. S/P CONVERTER
IC306	SVITOTX172	I.C. OPTICAL TRANSMITTER
IC401	MN1554PEF	I.C. SYSTEM CONTROL
IC402	BA6218	I.C. MOTOR DRIVE
IC501	AN8371S	I.C. DATA SLICE PLL
IC601	MN15283PEE	I.C. TIMING SIGNAL
IC602	AN6873N	I.C. FL DRIVE
IC604	HC-MD10E	I.C. REMOTE SENSOR
(E, EK, XL, EG) (EB, EH, EF) (E1, XA, XB) (PA, PE, PC)		
IC604	HC-MD12M	I.C. REMOTE SENSOR
(M, MC)		
IC801	PCM56P-J	I.C. D/A CONVERTER
IC802	PCM56P	I.C. D/A CONVERTER
IC803	PCM56P-J	I.C. D/A CONVERTER
IC804	PCM56P	I.C. D/A CONVERTER
IC809	SVINJM5532M	I.C. AMPLIFIER
IC810	SVINJM5532M	I.C. AMPLIFIER
IC811	SVINJM5532M	I.C. FILTER
IC812	SVINJM5532M	I.C. FILTER
IC813	SVIM5238FPTA	I.C. AMPLIFIER
IC814	SVIM5238FPTA	I.C. AMPLIFIER
IC815	SVIUPD4053G1	I.C. ANALOG SW.
IC816	SVIUPD4053G1	I.C. ANALOG SW.
IC871	SVINJM4556SA	I.C. HEADPHONES AMP
IC872	SVINJM4556SA	I.C. HEADPHONES AMP
TRANSISTORS		
Q12	2SB941-P	TRANSISTOR
Q15	2SD1266-P	TRANSISTOR
Q16	2SB941-P	TRANSISTOR
Q17	2SB1238QR	TRANSISTOR
Q18	2SD1266-P	TRANSISTOR
Q19	2SB941-P	TRANSISTOR
Q101	2SC4010-P	TRANSISTOR
Q141	2SD1862-P	TRANSISTOR
Q142	2SB1240-P	TRANSISTOR
Q161	2SD1862-P	TRANSISTOR
Q162	2SB1240-P	TRANSISTOR
Q181	2SD1266-P	TRANSISTOR
Q182	2SB941-P	TRANSISTOR
Q351	UN4112	TRANSISTOR
Q352	2SD1862-P	TRANSISTOR
Q353	2SB1240-P	TRANSISTOR
Q401	2SC3311A-Q	TRANSISTOR
Q402	2SC3311A-Q	TRANSISTOR
Q501	UN4112	TRANSISTOR
Q601	UN4114	TRANSISTOR
Q602	UN4114	TRANSISTOR
Q603	UN4114	TRANSISTOR
Q803	UN4114	TRANSISTOR
Q804	UN4114	TRANSISTOR
Q810	UN4211	TRANSISTOR
Q871	2SD1330R	TRANSISTOR
Q872	2SD1330R	TRANSISTOR
Q873	UN4114	TRANSISTOR
Q875	2SD1330R	TRANSISTOR
Q876	2SD1330R	TRANSISTOR
DIODES		
D11 ⚠	SVD1SR35200A	RECTIFIER
D12 ⚠	SVD1SR35200A	RECTIFIER
D13 ⚠	SVD1SR35200A	RECTIFIER
D14 ⚠	SVD1SR35200A	RECTIFIER
D15 ⚠	SVD1SR35200A	RECTIFIER
D16 ⚠	SVD1SR35200A	RECTIFIER
D17 ⚠	SVD1SR35200A	RECTIFIER
D18 ⚠	SVD1SR35200A	RECTIFIER
D19	MA723	DIODE
D21	SVDMTZ8R2	DIODE
D22	SVDMTZ8R2	DIODE
D24	SVDMTZ33	DIODE
D25	MA4033M	DIODE
D26	MA4033M	DIODE
D52 ⚠	SVDRDF02M	RECTIFIER
D61	MA165	DIODE
D62	MA165	DIODE
D63	MA165	DIODE
D64	MA165	DIODE
D65	MA4091-M	DIODE
D66	MA4091-M	DIODE
D67	MA165	DIODE
D131	MA165	DIODE
D181	MA165	DIODE
D182	MA165	DIODE
D183	MA165	DIODE
D184	MA165	DIODE
D401	MA4033M	DIODE
D601	MA165	DIODE
D602	MA165	DIODE
D603	MA165	DIODE
D604	MA165	DIODE
D605	MA165	DIODE
D607	MA165	DIODE
D608	MA165	DIODE
D609	MA165	DIODE
D610	MA165	DIODE
D611	MA165	DIODE
D612	MA165	DIODE
D613	MA165	DIODE
D614	MA165	DIODE
D615	MA165	DIODE
D616	MA165	DIODE
D617	MA165	DIODE
D621	SVGDPG7851Y	L.E.D
D622	SVGDAY7851	L.E.D
D623	SVGDLD701VR	L.E.D
D628	MA165	DIODE
D629	SVDSLR-54MW4	L.E.D
D630	SVDSLR-54MW4	L.E.D
D631	SVDSLR-54MW4	L.E.D
D801	MA165	DIODE
D802	MA165	DIODE
D803	MA165	DIODE
D804	MA165	DIODE
D805	MA165	DIODE
D806	MA165	DIODE
D807	MA165	DIODE
D808	MA165	DIODE
D810	MA165	DIODE
D811	MA165	DIODE
D812	MA165	DIODE

Ref. No.	Part No.	Description
I.C.PROTECTORS		
ICP1 (EK)	SRUN5	IC PROTECTOR
ICP2 (EK)	SRUN5	IC PROTECTOR
ICP3 (EK)	SRUN15	I.C.PROTECTOR
ICP4 (EK)	SRUN15	I.C.PROTECTOR
ICP5 (EK)	SRUN15	I.C.PROTECTOR
VARIABLE RESISTORS		
VR101	EVND3AA00B53	V.R. BEST EYE ADJ.
VR102	EVND3AA00B14	V.R. TR GAIN ADJ.
VR103	EVND3AA00B14	V.R. TR OFFSET ADJ.
VR104	EVND3AA00B14	V.R. FO GAIN ADJ.
VR105	EVND3AA00B14	V.R. FO OFFSET ADJ.
VR106	EVND3AA00B53	V.R. TR BALANCE ADJ.
VR501	EVN38CA00B13	V.R. PLL ADJ.
VR601	EVQWX3F2025B	V.R. SEARCH DIAL
VR801	EVND3AA00B53	V.R. D/A CON. DISTORTION ADJ.
VR802	EVND3AA00B53	V.R. D/A CON. DISTORTION ADJ.
VR871	EVUN1A022A14	V.R. HEADPHONES LEVEL
VR1001	EVN38CA00B15	V.R., D/A CON. OFFSET ADJ.
VR1002	EVN38CA00B15	V.R., D/A CON. OFFSET ADJ.
COILS AND TRANSFORMERS		
L1 ⚠	SLQX400-D	COIL
L2 ⚠	SLQX400-D	COIL
L301	ELEPK1R0KA	COIL
L304	ELEPK1R0KA	COIL
L307	ELEPK3R3KA	COIL
L308	ELEPK3R3KA	COIL
L310	ELEPK1R0KA	COIL
L801	ELEV820KA	COIL
L802	ELEV820KA	COIL
L871	ELEPK1R0KA	COIL
L872	ELEPK1R0KA	COIL
L873	ELEPK1R0KA	COIL
T1 ⚠ (M, MC)	SLTD5V036C	POWER TRANSFORMER
T1 ⚠ (EK, XA, XB) (PA, PE, PC)	SLTD5V037X	POWER TRANSFORMER
T1 ⚠ (E, EG, EB, EH) (EF, E1)	SLTD5V053E	POWER TRANSFORMER
T1 ⚠ (XL)	SLTD5V054G	POWER TRANSFORMER
T301	SLZS10VN17	PULSE TRANSFORMER
OSCILLATORS		
X301	SVQAT1693ATA	OSC., 16.9344MHZ
DISPLAYS		
FL601	SAD16MT06GK	DISPLAY
FUSES		
F1 ⚠ (E, EK, XL, EG) (EB, EH, EF) (E1)	XBA2C012TB0	FUSE, 250V, T125mA
F11 ⚠	XBA2C12TB0	FUSE, 250V, T1.25A
F12 ⚠ (EK, XA, XB) (PA, PE, PC)	XBA2C12TB0	FUSE, 250V, T1.25A
SWITCHES		
S1 ⚠	ESB8249V	POWER SWITCH
S2 ⚠ (EK, XA, XB) (PA, PE, PC)	SSR187-1	SW, VOLTAGE SELECTOR
S101	SSPD15	SW, REST
S102	SSPD16	SW, REST
S601	EVQQS405K	SW, OPEN/SLOSE
S602	EVQQS405K	SW, STOP
S603	EVQQS405K	SW, PAUSE
S604	EVQQS405K	SW, PLAY
S605	EVQQS405K	SW, PROGRAM
S606	EVQQS405K	SW, RECALL
S607	EVQQS405K	SW, TIME MODE
S608	EVQQS405K	SW, MUSIC SCAN
S609	EVQQS405K	SW, SIDE A/B
S611	EVQQS405K	SW, NUMERIC(1)
S612	EVQQS405K	SW, NUMERIC(2)
S613	EVQQS405K	SW, NUMERIC(3)
S614	EVQQS405K	SW, NUMERIC(4)
S615	EVQQS405K	SW, NUMERIC(5)
S616	EVQQS405K	SW, CLEAR
S617	EVQQS405K	SW, FORWARD SKIP
S619	EVQQS405K	SW, EDIT
S621	EVQQS405K	SW, NUMERIC(6)
S622	EVQQS405K	SW, NUMERIC(7)
S623	EVQQS405K	SW, NUMERIC(8)
S624	EVQQS405K	SW, NUMERIC(9)
S625	EVQQS405K	SW, NUMERIC(10)
S626	EVQQS405K	SW, NUMERIC(0)
S627	EVQQS405K	SW, BACKWARD SKIP
S629	EVQQS405K	SW, A-B PEAK LEVEL
S631	EVQQS405K	SW, NUMERIC(11)
S632	EVQQS405K	SW, NUMERIC(12)
S633	EVQQS405K	SW, NUMERIC(13)
S634	EVQQS405K	SW, NUMERIC(14)
S635	EVQQS405K	SW, NUMERIC(15)
S636	EVQQS405K	SW, NUMERIC(+10)
S637	EVQQS405K	SW, FORWARD INDEX
S638	EVQQS405K	SW, A/B REPEAT
S639	EVQQS405K	SW, PEAK
S641	EVQQS405K	SW, NUMERIC(16)
S642	EVQQS405K	SW, NUMERIC(17)
S643	EVQQS405K	SW, NUMERIC(18)
S644	EVQQS405K	SW, NUMERIC(19)
S645	EVQQS405K	SW, NUMERIC(20)
S647	EVQQS405K	SW, BACKWARD INDEX
S648	EVQQS405K	SW, REPEAT
S649	EVQQS405K	SW, DISPLAY
S651	SSS147-1	SW, TIMER
S653	EVQQS405K	SW, DIGITAL OUTPUT
S654	EVQQS405K	SW, RANDOM
S655	EVQQS405K	SW, AUTO CUE
S656	EVQQS405K	SW, SEARCH DIAL
RELAYS		
RLY801	SFDYG5A237P	RELAY, EMPHASIS
RLY802	SFDYG5A237P	RELAY, MUTING

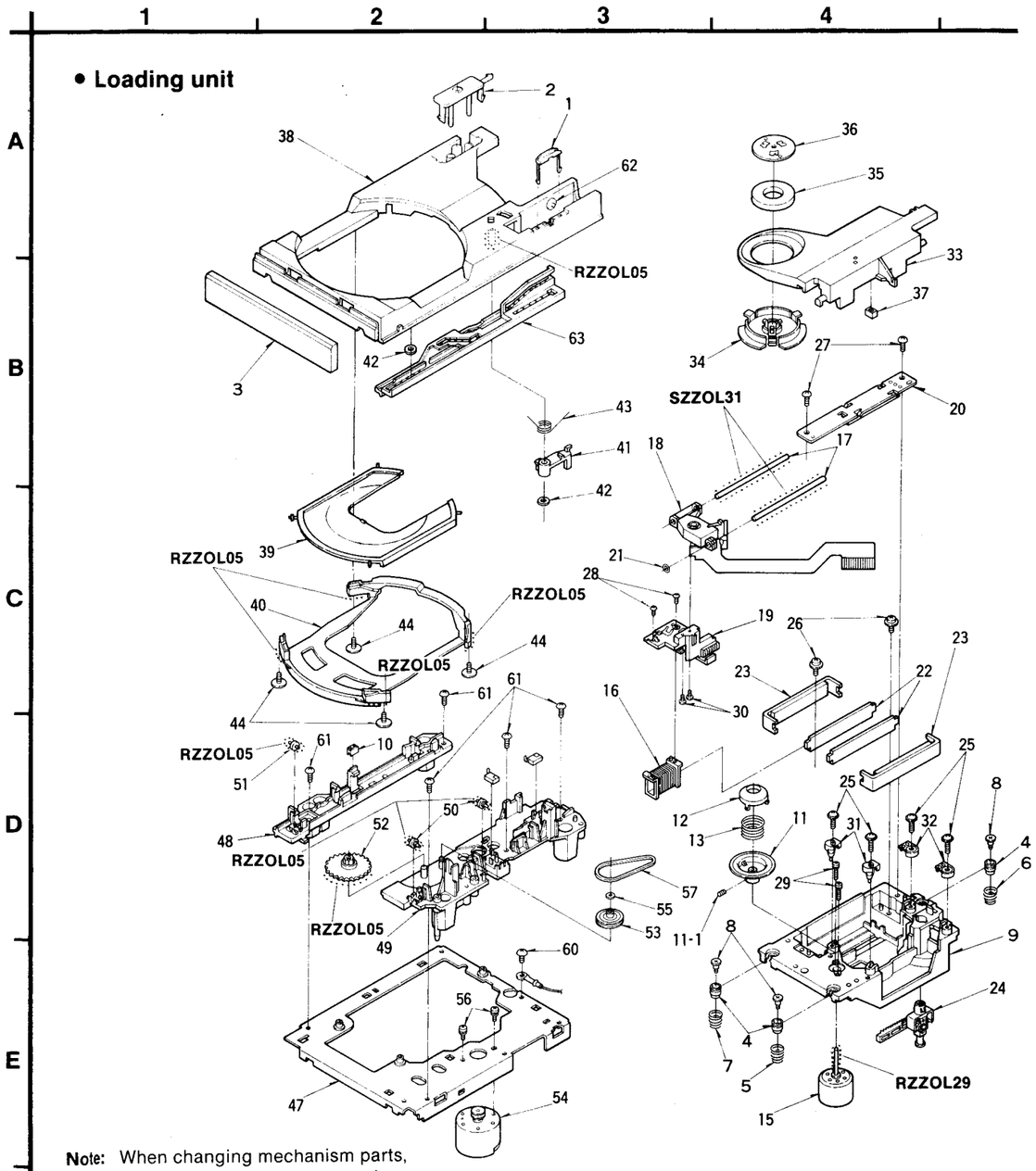
■ EXPLODED VIEWS

• Cabinet and chassis parts



101~130	116 117 119 118 111 120 115 109 116 108 107 120-1 114 111 121 125 128 113 123 106 129 110 112 122 124 126 127 112 112 111 115 105 112 103 107 113 112 112 112 130 113 113 103 139 112 133 104 101 111 102
131~157	146 147 146 157 147 153 143 150 146 152 155 154 136 145 137 132 131 138 135 134 140

• Loading unit



Note: When changing mechanism parts, apply the specified grease to the areas marked "XX" as shown in the drawing.

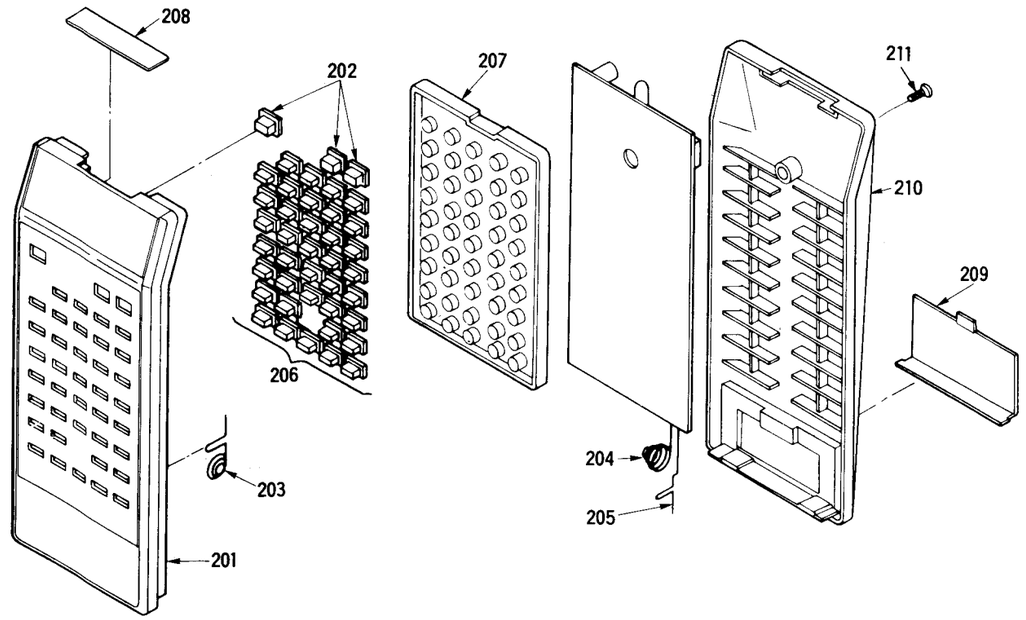
1~20	3 10 2 1 16 18 12 13 11-1 8 7 19 4 5 14 11 17 15 20 8 9 4 6
21~40	38 39 40 28 21 34 23 30 29 26 27 36 25 31 35 37 33 22 23 32 25 24
41~63	44 51 48 61 47 42 44 52 49 50 61 56 61 44 63 54 60 42 62 43 41 57 55 53 58

■ REPLACEMENT PARTS LIST (Mechanical parts)

Ref. No.	Part No.	Description
CABINET AND CHASSIS		
101	SKUD191ZF0A	CHASSIS
102 (M, MC)	SGPD720ZF0D	REAR PANEL
102 (XA)	SGPD720ZF1B	REAR PANEL
102 (E)	SGPLP770-KE	REAR PANEL
102 (EB, EH, EF) (EI)	SGPLP770-KEB	REAR PANEL
102 (EG)	SGPLP770-KEG	REAR PANEL
102 (EK)	SGPLP770-KEK	REAR PANEL
102 (PA, PE, PC)	SGPLP770-KPA	REAR PANEL
102 (XB)	SGPLP770-KXB	REAR PANEL
102 (XL)	SGPLP770-KXL	REAR PANEL
103	SKLD8-E	FOOT
104	SKUD170KF0A	BOTTOM BOARD
105	SHGD139	CUSHION SPACER
106 ⚠ (M, MC, XL)	SJSD16	AC INLET
106 ⚠ (E, EK, EG, EB) (EH, EF, EI) (XA, XB, PA) (PE, PC)	SJS9236	AC INLET
107	SUWD116	BRACKET
108	SUBD12	POWER SWITCH ROD
109	SBC666-5	BUTTON, POWER
110	SYQD530KME1	CABINET
111	XTV3+8JFZ	SCREW
112	XTV3+8G	SCREW
113	XTV3+8J	SCREW
114	SNE4021	NUT
115	SNE2129-1	SCREW
116	SHDD4	SCREW
117	SGWLP770-KM	FRONT PANEL
118	SGYLP990-KM	FRONT GRILLE
119	SBN1161-2	KNOB, HEADPHONES LEVEL
120	SBND70MW0A	SEARCH DIAL
120-1	SHR9541-1	SPACER
121	SBCD4750ZK0A	BUTTON, DIGITAL OUTPUT
122	SBCD4760ZK0B	BUTTON, MAIN
123	SBCD4770ZK0B	BUTTON, NUMERIC(A)
124	SBCD4780ZK0B	BUTTON, NUMERIC(B)
125	SBCD4790ZK0B	BUTTON, INDEX
126	SBCD4811ZK0A	BUTTON, REPEAT
127	SBCD4840ZK0A	BUTTON, EDIT
128	SBDD91ZK0A	KNOB, TIMER
129	SUWD94	BRACKET, BUTTON
130	EMCS0950Z	CONNECTOR (CN11)
131	EMCS0350Z	CONNECTOR (CN103)
132	EMCS0550Z	CONNECTOR (CN401)
133	EMCS0650Z	CONNECTOR (CN801)
134	SJSD0905	CONNECTOR (FC402)
135	EMCS0250Z	CONNECTOR (CN351)
136	EMCS0552M	CONNECTOR (CN102)
137	SJSD1709	CONNECTOR (CN101)
138	SJSD0905	CONNECTOR (FC401)
139	SJFD7-1	JACK (DIGITAL OUTPUT)
140	SJFD4-1	TERMINAL PLATE (PHONO)
142	EMCS0650ZL	CONNECTOR (CN871)
143	SJJD17B	JACK, HEADPHONES
145	SRDJ001N14E	SHORTING CONNECTOR (CN102)
146	SHGD122-1	CUSHION RUBBER
147	SHGD123	CUSHION RUBBER
152	SHRD133	LED BLOCK
153	SHRLP990-KN	LED BLOCK
154	SHRD169	LED HOLDER
155	SHGD142	FL HOLDER
157	XNS7	NUT
160	SHRD51-1	HOLDER

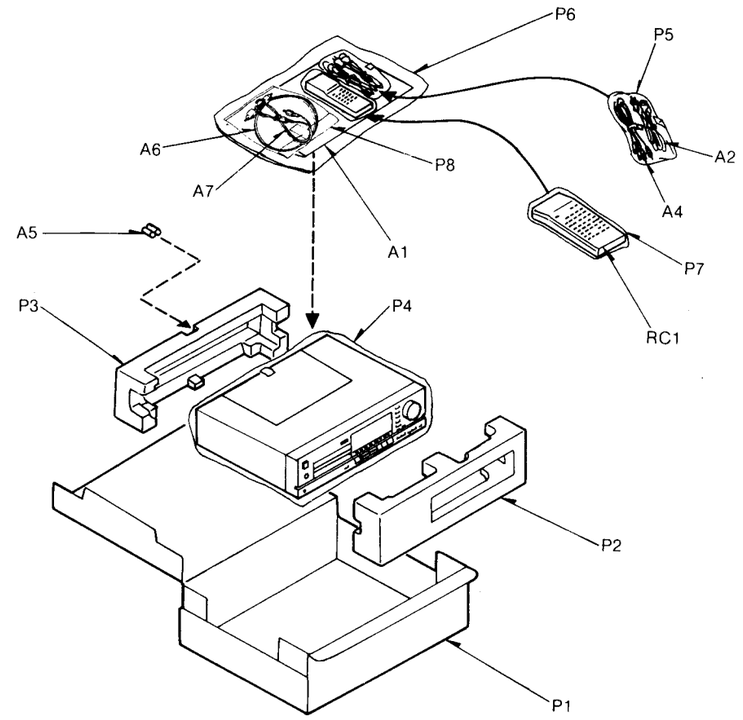
Ref. No.	Part No.	Description
LOADING MECHANICAL		
1	SHRD150	ROLLER HOLDER
2	SHRD144	COVER WITH CLAW
3	SGXD3150ZK0B	ORNAMENT PANEL
4	SHGD110	CUSHION RUBBER
5	SUSD126	SPRING (RED)
6	SUSD127	SPRING (BLUE)
7	SUSD128	SPRING (YELLOW)
8	SFXGB20-01	SCREW
9	SISD13-3	TRAVERSE BASE
10	SFGZB63M51	CUSHION RUBBER
11	SD0D28-1E	TURNTABLE
11-1	XXE26D5	SCREW
12	SD0D29-2	RING
13	SRQA010N04	SPRING
15	SJGDRF310T	SPINDLE MOTOR
16	SORD21E-1	TRAVERSE COIL
17	SUXD78-2	GUIDE SHAFT
18 ⚠	S0AD60A-1	OPTICAL PICKUP
19	EWSL11A00000	COIL HOLDER
20	EWS7G0A00Q53	RESISTANCE UNIT
21	SHGD131	STOPPER
22	S0YD8E-1	YOKE (A)
23	S0YD9	YOKE (B)
24	SHRD23-2	LOCK SHAFT
25	XTV3+12GFZ	SCREW
26	SNSD27	SCREW
27	XTV3+8G	SCREW
28	XTV2+4G	SCREW
29	XYM2+C12	SCREW
30	XQN17+C6	SCREW
31	SHRD136	GUIDE SHAFT HOLDER(A)
32	SHRD137	GUIDE SHAFT HOLDER(B)
33	SIRD42-2	CLAMPER
34	SIRD51	HOLDER
35	S0MD4	MAGNET
36	S0YD2	YOKE
37	SHGD119	CUSHION RUBBER
38	SIRLP990-KM	DISC HOLDER
39	SIRD98	DISC TRAY
40	SIRD99	TRAY BASE
41	SIRD96	LOCK LEVER
42	SFUMZ15R61	WASHER
43	SUSD83	SPRING
44	SFXGQ06N01	SCREW
46	XTV3+6BFN	SCREW
47	SIWLP320-KM	LOADING BASE
48	SIRD43-3	BRACKET(A), LOADING BASE
49	SIRLP320KM3	BRACKET(B), LOADING BASE
50	SDRD2	ROLLER
51	SDRD6	ROLLER
52	SDGD38	MAIN GEAR
53	SDGD39-2	PULLEY GEAR
54	SMNLP320-KM	LOADING MOTOR
55	SHWD20	WASHER
56	XYN26+T4	SCREW
57	SMBD3	DRIVE BELT
61	XTV3+8JFZ	SCREW
62	SDRD12	ROLLER
63	SIRD40-2	RACK GEAR

■ REMOTE CONTROL UNIT PARTS



Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	MN6030B	I.C. REMOTE SIGNAL
IC1 (M, MC)	MN6030CA	I.C., REMOTE SIGNAL
TRANSISTORS		
Q1	UN1231	TRANSISTOR
DIODES		
D1	LN66	L.E.D
D2	MA154WK	DIODE
D4	MA154WK	DIODE
D6	MA154WK	DIODE
D8	MA154WK	DIODE
D10	MA154WA	DIODE
OSCILLATOR		
X1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	CSB420PB1	OSCILLATOR
X1 (M, MC)	CSB455EB1	OSCILLATOR
RESISTORS		
R1	ERDS2TJ1R0	CARBON, 1Ω, 1/4W
CAPACITORS		
C1 (M, MC)	ECKD1H101KB	CERAMIC, 100PF, 50V
C1 (E, EK, XL, EG) (EB, EH, EF)	ECKD1H471KB	CERAMIC, 470PF, 50V
(EI, XA, XB) (PA, PE, PC)		
C2 (M, MC)	ECKD1H101KB	CERAMIC, 100PF, 50V
C2 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	ECKD1H121KB	CERAMIC, 120PF, 50V
C3	ECEA0GK101	ELECTROLYTIC, 6.3 V 100 μF
MECHANISM PARTS		
201 (M, MC)	UR64VCS425	UPPER CABINET
201 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	UR64VCS426	UPPER CABINET
202	SBCLP990-KN1	BUTTON(A)
203	UR64TD374	BATTERY TERMINAL
204	UR64TD373	BATTERY TERMINAL (-)
205	UR64TD372	BATTERY TERMINAL (+)
206	SBCLP990-KN2	BUTTON(B)
207	UR64CT369	RUBBER CONTACT
208	UR52SB327	PLATE
209	UR64EC366	BATTERY COVER
210	UR64CS365A	LOWER CABINET
211	XTS26+10GFZ	SCREW
REMOTE CONTROL ASS'Y		
RC1 (M, MC)	EUR64712	REMOTE CONT.(REF TO NOTE)
RC1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	EUR64713	REMOTE CONT.(REF TO NOTE)

■ PACKING



Ref. No.	Part No.	Description
PACKING MATERIAL		
P1 (M, E, EK, XL) (EG, EB, EH) (EI, XA, XB) (PA, PE, PC)	SPND244	CARTON BOX
P1 (MC)	SPND245	CARTON BOX
P1 (EF)	SPND246	CARTON BOX
P2	SPSD133	PAD (FRONT)
P3	SPSD134	PAD (REAR)
P4	XZB60X60A010	PROTECTION COVER (UNIT)
P5	XZB26X17C03	PROTECTION BAG (CORDS)
P6	XZB23X35C03	PROTECTION BAG (INST. MANUAL)
P7	XZB23X20C03	PROTECTION BAG (CORDS)
P8	SRHZJ02N01	PROTECTION BAG (REMOTE CONT.)
ACCESSORIES		
A1 (M)	SQUD269	INSTRUCTION MANUAL
A1 (EK, XL, EF) (XA)	SQUD271	INSTRUCTION MANUAL
A1 (EG)	SQUD273	INSTRUCTION MANUAL
A1 (EI)	SQUD275	INSTRUCTION MANUAL
A1 (E, EB, EH)	SQULP770-KE	INSTRUCTION MANUAL
A1 (MC)	SQULP770-KMC	INSTRUCTION MANUAL
A1 (PA, PE, PC)	SQULP770-KPA	INSTRUCTION MANUAL
A1 (XB)	SQULP770-KXB	INSTRUCTION MANUAL
A2 ⚠ (EK)	SFDAC05G02	POWER CORD
A2 ⚠ (XA, PA, PE) (PC)	SJA168	POWER CORD
A2 ⚠ (MC)	SJA172	POWER CORD
A2 ⚠ (M)	SJA172-1	POWER CORD
A2 ⚠ (XL)	SJA173	POWER CORD
A2 ⚠ (XB)	SJA183	POWER CORD
A2 ⚠ (E, EG, EB, EH) (EF, EI)	SJA187	POWER CORD
A3 ⚠ (XA, XB, PA) (PE, PC)	RJP120ZBS-H	AC PLUG ADAPTOR
A4	SJP2249-2	OUTPUT CORD
A5 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)		BATTERY
A5 (M, MC)		BATTERY
A6	SJPD16	OPTICAL OUTPUT CORD
A7	SJPD19	DIGITAL OUTPUT CORD

■ RESISTORS AND CAPACITORS

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value

ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value 47x10¹ (ohm)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity

ECEA	50	M	330
Type	Voltage	Peculiarity	Value (33x10⁰ microfarad)

Resistor Type	Wattage	Tolerance
ERD : Carbon ERG : Metal Oxide ERX : Metal Film ERQ : Fuse Type Metal ERD□ L : Carbon (chip) ERO□ K : Metal Film (chip) ERC : Solid	10 : 1/8W 12 : 1/2W 25 : 1/4W 1A : 1W 18 : 1/8W S2 : 1/4W S1 : 1/2W 2F : 1/4W 50 : 1/2W 2A : 2W	J : ±5% F : ±1% G : ±2% K : ±10%

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic ECCD : Ceramic ECKD : Ceramic ECQM : Polyester ECQP : Polypropylene ECG : Ceramic ECEA□□□N: Non Polar Electrolytic QCU□ : Ceramic (Chip Type) ECUX : Ceramic (Chip Type) ECF : Semiconductor EECW : Liquid electrolyte double layer capacitor	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1H : 50V 1V : 35V 50 : 50V 05 : 50V 2H : 500V 2A : 100V 1 : 100V KC: 400V AC KC: 125VAC (UL) 1J : 63V	C : ±0.25pF J : ±5% K : ±10% Z : +80% −20% P : +100% −0% M : ±20% D : ±0.5pF G : ±2%

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R12	ERDS2TJ101	100 1/4
R16	ER0S2TKG6801	6.8K 1/4
R17	ER0S2TKG6801	6.8K 1/4
R21	ERDS2TJ331	330 1/4
R22	ERDS2TJ331	330 1/4
R25	ERDS2TJ222	2.2K 1/4
R26	ERDS2TJ392	3.9K 1/4
R27	ERDS2TJ392	3.9K 1/4
R30	ERDS2TJ101	100 1/4
(M, MC, E, XL)		
(EG, EB, EH)		
(EF, EI, XA)		
(XB, PA, PE)		
(PC)		
R30	ERG1SJ101P	100 1
(EK)		
R31	ERDS2TJ101	100 1/4
(M, MC, E, XL)		
(EG, EB, EH)		
(EF, EI, XA)		
(XB, PA, PE)		
(PC)		
R31	ERG1SJ101P	100 1
(EK)		
R34	ERDS2TJ102	1K 1/4
R35	ERDS2TJ102	1K 1/4
R38	ERDS2TJ105	1M 1/4
R39	ERDS2TJ105	1M 1/4
R42	ERDS2TJ332	3.3K 1/4
R43	ERDS2TJ332	3.3K 1/4
R44	ERDS2TJ102	1K 1/4
R45	ERDS2TJ102	1K 1/4
R46	ERDS2TJ471	470 1/4
R48	ERDS2TJ471	470 1/4
R51	ERDS2TJ222	2.2K 1/4
R101	ERDS2TJ154	150K 1/4
R102	ERDS2TJ472	4.7K 1/4
R103	ERDS2TJ472	4.7K 1/4
R104	ERDS2TJ223	22K 1/4
R105	ERDS2TJ334	330K 1/4
R107	ERDS2TJ683	68K 1/4
R108	ERDS2TJ332	3.3K 1/4
R109	ERDS2TJ822	8.2K 1/4
R110	ERDS2TJ682	6.8K 1/4
R111	ERDS2TJ682	6.8K 1/4
R112	ERDS2TJ822	8.2K 1/4
R113	ERDS2TJ152	1.5K 1/4
R114	ERDS2TJ152	1.5K 1/4
R115	ERDS2TJ102	1K 1/4
R116	ERDS2TJ182	1.8K 1/4
R117	ERDS2TJ182	1.8K 1/4
R118	ERDS2TJ102	1K 1/4
R119	ERDS2TJ102	1K 1/4
R120	ERDS2TJ120	12 1/4
R121	ERDS2TJ393	39K 1/4
R122	ERDS2TJ471	470 1/4
R131	ERDS2TJ270	27 1/4
R141	ERDS2TJ102	1K 1/4
R142	ERDS2TJ333	33K 1/4
R143	ERDS2TJ124	120K 1/4
R144	ERDS2TJ333	33K 1/4
R145	ERDS2TJ153	15K 1/4
R146	ERDS2TJ122	1.2K 1/4
R147	ERDS2TJ682	6.8K 1/4
R148	ERDS2TJ104	100K 1/4
R149	ERDS2TJ152	1.5K 1/4
R150	ERDS2TJ103	10K 1/4
R151	ERDS2TJ101	100 1/4
R152	ERDS2TJ153	15K 1/4
R153	ERDS2TJ270	27 1/4
R154	ERDS2TJ3R3	3.3 1/4
R155	ERDS2TJ330	33 1/4
R161	ERDS2TJ333	33K 1/4
R162	ERDS2TJ222	2.2K 1/4
R163	ERDS2TJ333	33K 1/4
R164	ERDS2TJ153	15K 1/4
R165	ERDS2TJ122	1.2K 1/4
R166	ERDS2TJ102	1K 1/4
R166	ERDS2TJ102	1K 1/4
R167	ERDS2TJ681	680 1/4
R168	ERDS2TJ272	2.7K 1/4
R169	ERDS2TJ392	3.9K 1/4
R170	ERDS2TJ101	100 1/4
R171	ERDS2TJ270	27 1/4
R172	ERDS2TJ3R3	3.3 1/4
R180	ERDS2TJ474	470K 1/4
R181	ERDS2TJ471	470 1/4
R182	ERDS2TJ564	560K 1/4
R183	ERDS2TJ564	560K 1/4
R184	ERDS2TJ223	22K 1/4
R185	ERDS2TJ473	47K 1/4
R186	ERDS2TJ473	47K 1/4
R187	ERDS2TJ473	47K 1/4
R188	ERDS2TJ473	47K 1/4
R189	ERDS2TJ562	5.6K 1/4
R190	ERDS2TJ123	12K 1/4
R191	ERDS2TJ154	150K 1/4
R192	ERDS2TJ824	820K 1/4
R193	ERDS2TJ101	100 1/4
R194	ERDS2TJ683	68K 1/4
R195	ERDS2TJ103	10K 1/4
R196	ERDS2TJ103	10K 1/4
R197	ERDS2TJ473	47K 1/4
R198	ERDS2TJ473	47K 1/4
R199	ERDS2TJ473	47K 1/4
R301	ERDS2TJ121	120 1/4
R302	ERDS2TJ152	1.5K 1/4
R303	ERDS2TJ391	390 1/4
R308	ERDS2TJ151	150 1/4
R309	ERDS2TJ151	150 1/4
R311	ERDS2TJ822	8.2K 1/4
R312	ERDS2TJ104	100K 1/4
R352	ERDS2TJ334	330K 1/4
R355	ERDS2TJ333	33K 1/4
R356	ERDS2TJ333	33K 1/4
R358	ERDS2TJ103	10K 1/4
R359	ERDS2TJ274	270K 1/4
R360	ERDS2TJ123	12K 1/4
R361	ERDS2TJ101	100 1/4
R362	ERDS2TJ8R2	8.2 1/4
R401	ERDS2TJ472	4.7K 1/4
R402	ERDS2TJ472	4.7K 1/4
R403	ERDS2TJ472	4.7K 1/4
R404	ERDS2TJ472	4.7K 1/4

Ref. No.	Part No.	Value.
R406	ERDS2TJ221	220 1/4
R407	ERDS2TJ102	1K 1/4
R408	ERDS2TJ102	1K 1/4
R409	ERDS2TJ472	4.7K 1/4
R410	ERDS2TJ472	4.7K 1/4
R411	ERDS2TJ472	4.7K 1/4
R412	ERDS2TJ472	4.7K 1/4
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ104	100K 1/4
R416	ERDS2TJ221	220 1/4
R417	ERDS2TJ221	220 1/4
R418	ERDS2TJ221	220 1/4
R419	ERDS2TJ221	220 1/4
R420	ERDS2TJ221	220 1/4
R421	ERDS2TJ221	220 1/4
R422	ERDS2TJ221	220 1/4
R423	ERDS2TJ221	220 1/4
R424	ERDS2TJ472	4.7K 1/4
R425	ERDS2TJ220	22 1/4
R426	ERDS2TJ472	4.7K 1/4
R501	ERDS2TJ224	220K 1/4
R502	ERDS2TJ562	5.6K 1/4
R503	ERDS2TJ474	470K 1/4
R504	ERDS2TJ221	220 1/4
R505	ERDS2TJ104	100K 1/4
R506	ERDS2TJ333	33K 1/4
R507	ERDS2TJ102	1K 1/4
R601	ERDS2TJ472	4.7K 1/4
R602	ERDS2TJ472	4.7K 1/4
R603	ERDS2TJ472	4.7K 1/4
R604	ERDS2TJ472	4.7K 1/4
R605	ERDS2TJ472	4.7K 1/4
R606	ERDS2TJ472	4.7K 1/4
R607	ERDS2TJ472	4.7K 1/4
R608	ERDS2TJ472	4.7K 1/4
R609	ERDS2TJ472	4.7K 1/4
R610	ERDS2TJ472	4.7K 1/4
R611	ERDS2TJ472	4.7K 1/4
R612	ERDS2TJ472	4.7K 1/4
R613	ERDS2TJ472	4.7K 1/4
R614	ERDS2TJ472	4.7K 1/4
R615	ERDS2TJ472	4.7K 1/4
R616	ERDS2TJ472	4.7K 1/4
R617	ERDS2TJ121	120 1/4
R618	ERDS2TJ121	120 1/4
R619	ERDS2TJ391	390 1/4
R625	ERDS2TJ221	220 1/4
R626	ERDS2TJ105	1M 1/4
R817	FSR25TG472	4.7 1/4
R818	FSR25TG472	4.7 1/4
R819	FSR25TG472	4.7 1/4
R820	FSR25TG472	4.7 1/4
R821	FSR25TG472	4.7 1/4
R822	FSR25TG472	4.7 1/4
R823	FSR25TG682	6.8 1/4
R824	FSR25TG682	6.8 1/4
R825	FSR25TG332	3.3K 1/4
R826	FSR25TG332	3.3K 1/4
R827	ERDS2TJ100	10 1/4
R828	ERDS2TJ100	10 1/4
R829	ERDS2TJ330	33 1/4
R830	ERDS2TJ330	33 1/4
R831	ERDS2TJ102	1K 1/4
R832	ERDS2TJ102	1K 1/4
R833	ERDS2TJ103	10K 1/4
R834	ERDS2TJ103	10K 1/4
R835	ERDS2TJ392	3.9K 1/4
R836	ERDS2TJ392	3.9K 1/4
R837	ER010TKD1202	12K 10
R838	ER010TKD1202	12K 10
R839	ERDS2TJ823	82K 1/4
R840	ERDS2TJ823	82K 1/4
R841	ERDS2TJ103	10K 1/4
R842	ERDS2TJ103	10K 1/4
R843	ERDS2TJ824	820K 1/4
R844	ERDS2TJ824	820K 1/4
R845	ERDS2TJ182	1.8K 1/4
R846	ERDS2TJ182	1.8K 1/4
R847	ERDS2TJ821	820 1/4
R848	ERDS2TJ821	820 1/4
R849	ERDS2TJ182	1.8K 1/4
R850	ERDS2TJ182	1.8K 1/4
R851	ERDS2TJ101	100 1/4
R852	ERDS2TJ101	100 1/4
R853	ERDS2TJ471	470 1/4
R854	ERDS2TJ471	470 1/4
R855	ERDS2TJ472	4.7K 1/4
R856	ERDS2TJ472	4.7K 1/4
R857	ERDS2TJ332	3.3K 1/4
R858	ERDS2TJ332	3.3K 1/4
R859	ER010TKD1202	12K 10
R860	ER010TKD1202	12K 10
R861	ER010TKD1202	12K 10
R862	ER010TKD1202	12K 10
R863	ER010TKD1202	12K 10
R864	ER010TKD1202	12K 10
R865	ER010TKD1202	12K 10
R866	ER010TKD1202	12K 10
R867	ERDS2TJ102	1K 1/4
R868	ERDS2TJ104	100K 1/4
R869	ERDS2TJ101	100 1/4
R870	ERDS2TJ101	100 1/4
R871	ERDS2TJ103	10K 1/4
R872	ERDS2TJ103	10K 1/4
R873	ERDS2TJ123	12K 1/4
R874	ERDS2TJ123	12K 1/4
R875	ERDS2TJ104	100K 1/4
R876	ERDS2TJ104	100K 1/4
R877	ERDS2TJ330	33 1/4
R878	ERDS2TJ330	33 1/4
R879	ERDS2TJ332	3.3K 1/4
R880	ERDS2TJ332	3.3K 1/4
R881	ERDS2TJ100	10 1/4
R882	ERDS2TJ100	10 1/4
R883	ERDS2TJ102	1K 1/4
R884	ERDS2TJ102	1K 1/4
R885	ERDS2TJ222	2.2K 1/4
R886	ERDS2TJ222	2.2K 1/4
R887	ERDS2TJ680	68 1/4
R888	ERDS2TJ680	68 1/4
R889	ERDS2TJ470	47 1/4
R890	ERDS2TJ470	47 1/4
R891	ERDS2TJ332	3.3K 1/4
R892	ERDS2TJ332	3.3K 1/4
R893	ERDS2TJ332	3.3K 1/4
R894	ERDS2TJ332	3.3K 1/4
R895	ERDS2TJ104	100K 1/4
R896	ERDS2TJ104	100K 1/4
R897	ERDS2TJ222	2.2K 1/4
R898	ERDS2TJ222	2.2K 1/4
R899	ERDS2TJ102	1K 1/4
R900	ERDS2TJ102	1K 1/4
R901	ERDS2TJ103	10K 1/4
R1002	ER0S2TKG1003	100K 1/4
R1003	ER0S2TKG1003	100K 1/4
R1004	ER0S2TKG1003	100K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C1 ⚠	ECKDKC103PF2	0.01 125
C11 ⚠	ECFTD103KXL	0.01 25
C12 ⚠	ECFTD103KXL	0.01 25
C14	ECFF1E104ZF	0.1 25
C15	ECEA1CU332	3300 16
C16	ECEA1CU332	3300 16
C17	ECEA1CU470	47 16
C18	ECEA1CU470	47 16
C19	ECEA0JS331	330 6.3
C20	ECEA0JS331	330 6.3
C21	ECFF1E104ZF	0.1 25
C22	ECFF1E104ZF	0.1 25
C27	ECKD1H102KB	0.001 50
C28	ECKD1H102KB	0.001 50
C31	ECEA1AU101	100 10
C32	ECEA1AU101	100 10
C33	ECEA25V330V	330 25
C34	ECEA25V330V	330 25
C37	ECEA1HK010	1 50
C38	ECEA1HK010	1 50
C39	ECEA50V330V	330 50
C40	ECEA50V330V	330 50
C43	ECEA1HK010	1 50
C61 ⚠	ECFTD103KXL	0.01 25
C62 ⚠	ECFTD103KXL	0.01 25
C63	UKS1C222M1AA	0.0022 16
C64	UKS1C222M1AA	0.0022 16
C65	ECQM1H103JZ	0.01 50
C66	ECQM1H103JZ	0.01 50
C67	ARA1A470M0T	47 10
C68	ARA1A470M0T	47 10
C69	REC1A101M0T	100 10
C70	REC1A101M0T	100 10
C83	ECEA1AU101	100 10
C84	ECEA1AU101	100 10
C86	ECCD1H120KC	12P 50
C87	REC1C101M0T	100 16
C88	REC1C101M0T	100 16
C94	ECCD1H120KC	12P 50
C95	ECEA1CU331	330 16
C101	ECQV1H104JZ	0.1 50
C102	ECKD1H102KB	0.001 50
C103	ECKD1H102KB	0.001 50
C104	ECKD1H681K	680P 50
C105	ECKD1H471KB	470P 50
C106	ECKD1H471KB	470P 50
C107	ECCD1H220K	22P 50
C108	ECEA1HK0R1	0.1 50
C109	ECEA1HK010	1 50
C110	ECQV1H104JZ	0.1 50
C111	ECEA1HK100	10 50
C112	ECEA1CKS100	10 16
C113	ECEA1HK010	1 50
C114	RCBS1C182MXY	0.0018 16
C115	ECKD1H682KB	0.0068 50
C116	ECQM1H333JZ	0.033 50
C117	RCBS1H221KBY	220P 50
C118	ECEA1HK010	1 50
C119	ECEA0JK220	22 6.3
C120	ECKD1H681K	680P 50
C121	ECFTD103KXL	0.01 25
C122	ECBT1H101KB5	100P 50
C123	ECBT1H101KB	100P 50
C124	ECKD1H222KB	0.0022 50
C125	ECEA0JK470	47 6.3
C126	ECEA0JK470	47 6.3
C127	ECKD1H102KB	0.001 50
C128	ECKD1H102KB	0.001 50
C129	ECKD1H681K	680P 50
C131	ECEA0JK221	220 6.3
C141	ECQM1H153JZ	0.015 50
C142	ECQM1H122JZ	0.0012 50
C143	ECQM1H473JZ	0.047 50
C144	ECEA1HKN2R2	2.2 50
C145	ECEA1HKNR22	0.22 50
C161	ECQM1H153JZ	0.015 50
C162	ECKD1H681K	680P 50
C163	ECQM1H103JZ	0.01 50
C164	ECEA1HKN3R3	3.3 50
C165	ECEA1HKN0R1	0.1 50
C168	ECEA1CKN100	10 16
C169	RCBS1C103MYY	0.01 16
C181	ECQM1H474JZ	0.47 50
C182	RCBS1H221KBY	220P 50
C183	ECQM1H682JZ	0.0068 50
C184	ECEA1HKN010	1 50
C186	ECQM1H224JZ	0.22 50
C187	ECEA1HKNR47	0.47 50
C301	ECFF1E104ZF	0.1 25
C302	ECFF1E104ZF	0.1 25
C303	ECEA0JK470	47 6.3
C304	ECFF1E104ZF	0.1 25

Ref. No.	Part No.	Value.
C305	EC	
C306	EC	
C307	EC	
C308	EC	
C309	EC	
C310	EC	
C311	EC	
C312	EC	
C313	EC	
C314	EC	
C351	EC	
C352	EC	
C353	EC	
C401	EC	
C402	EC	
C403	EC	
C405	EC	
C501	EC	
C502	EC	
C503	EC	
C504	EC	
C505	EC	
C506	EC	
C507	EC	
C508	EC	
C509	EC	

	Tolerance
	J : ±5% F : ±1% G : ±2% K : ±10%

	Tolerance
	C : ±0.25pF J : ±5% K : ±10% Z : +80% −20% P : +100% −0% M : ±20% D : ±0.5pF G : ±2%

	Value.
	100 1/4
	27 1/4
	3.3 1/4
	470K 1/4
	470 1/4
	560K 1/4
	560K 1/4
	22K 1/4
	47K 1/4
	47K 1/4
	47K 1/4
	47K 1/4
	5.6K 1/4
	12K 1/4
	150K 1/4
	820K 1/4
	100 1/4
	68K 1/4
	10K 1/4
	10K 1/4
	47K 1/4
	47K 1/4
	47K 1/4
	120 1/4
	1.5K 1/4
	390 1/4
	150 1/4
	150 1/4
	8.2K 1/4
	100K 1/4
	330K 1/4
	33K 1/4
	33K 1/4
	10K 1/4
	270K 1/4
	12K 1/4
	100 1/4
	8.2 1/4
	4.7K 1/4
	4.7K 1/4
	4.7K 1/4
	4.7K 1/4

Ref. No.	Part No.	Value.
R406	ERDS2TJ221	220 1/4
R407	ERDS2TJ102	1K 1/4
R408	ERDS2TJ102	1K 1/4
R409	ERDS2TJ472	4.7K 1/4
R410	ERDS2TJ472	4.7K 1/4
R411	ERDS2TJ472	4.7K 1/4
R412	ERDS2TJ472	4.7K 1/4
R413	ERDS2TJ472	4.7K 1/4
R414	ERDS2TJ472	4.7K 1/4
R415	ERDS2TJ104	100K 1/4
R416	ERDS2TJ221	220 1/4
R417	ERDS2TJ221	220 1/4
R418	ERDS2TJ221	220 1/4
R419	ERDS2TJ221	220 1/4
R420	ERDS2TJ221	220 1/4
R421	ERDS2TJ221	220 1/4
R422	ERDS2TJ221	220 1/4
R423	ERDS2TJ221	220 1/4
R424	ERDS2TJ472	4.7K 1/4
R425	ERDS2TJ220	22 1/4
R426	ERDS2TJ472	4.7K 1/4
R501	ERDS2TJ224	220K 1/4
R502	ERDS2TJ562	5.6K 1/4
R503	ERDS2TJ474	470K 1/4
R504	ERDS2TJ221	220 1/4
R505	ERDS2TJ104	100K 1/4
R506	ERDS2TJ333	33K 1/4
R507	ERDS2TJ102	1K 1/4
R601	ERDS2TJ472	4.7K 1/4
R602	ERDS2TJ472	4.7K 1/4
R603	ERDS2TJ472	4.7K 1/4
R604	ERDS2TJ472	4.7K 1/4
R605	ERDS2TJ472	4.7K 1/4
R606	ERDS2TJ472	4.7K 1/4
R607	ERDS2TJ472	4.7K 1/4
R608	ERDS2TJ472	4.7K 1/4
R609	ERDS2TJ472	4.7K 1/4
R610	ERDS2TJ472	4.7K 1/4
R611	ERDS2TJ472	4.7K 1/4
R612	ERDS2TJ472	4.7K 1/4
R613	ERDS2TJ472	4.7K 1/4
R614	ERDS2TJ472	4.7K 1/4
R615	ERDS2TJ472	4.7K 1/4
R616	ERDS2TJ472	4.7K 1/4
R617	ERDS2TJ121	120 1/4
R618	ERDS2TJ121	120 1/4
R619	ERDS2TJ391	390 1/4
R625	ERDS2TJ221	220 1/4
R626	ERDS2TJ105	1M 1/4
R817	FSR25TG472	4.7 1/4
R818	FSR25TG472	4.7 1/4
R819	FSR25TG472	4.7 1/4
R820	FSR25TG472	4.7 1/4
R821	FSR25TG472	4.7 1/4
R822	FSR25TG472	4.7 1/4
R823	FSR25TG682	6.8 1/4
R824	FSR25TG682	6.8 1/4
R825	FSR25TG332	3.3K 1/4
R826	FSR25TG332	3.3K 1/4
R827	ERDS2TJ100	10 1/4
R828	ERDS2TJ100	10 1/4
R829	ERDS2TJ330	33 1/4
R830	ERDS2TJ330	33 1/4
R831	ERDS2TJ102	1K 1/4
R832	ERDS2TJ102	1K 1/4
R833	ERDS2TJ103	10K 1/4
R834	ERDS2TJ103	10K 1/4
R835	ERDS2TJ392	3.9K 1/4
R836	ERDS2TJ392	3.9K 1/4
R837	ER010TKD1202	12K 10
R838	ER010TKD1202	12K 10
R839	ERDS2TJ823	82K 1/4
R840	ERDS2TJ823	82K 1/4
R841	ERDS2TJ103	10K 1/4
R842	ERDS2TJ103	10K 1/4
R843	ERDS2TJ824	820K 1/4
R844	ERDS2TJ824	820K 1/4

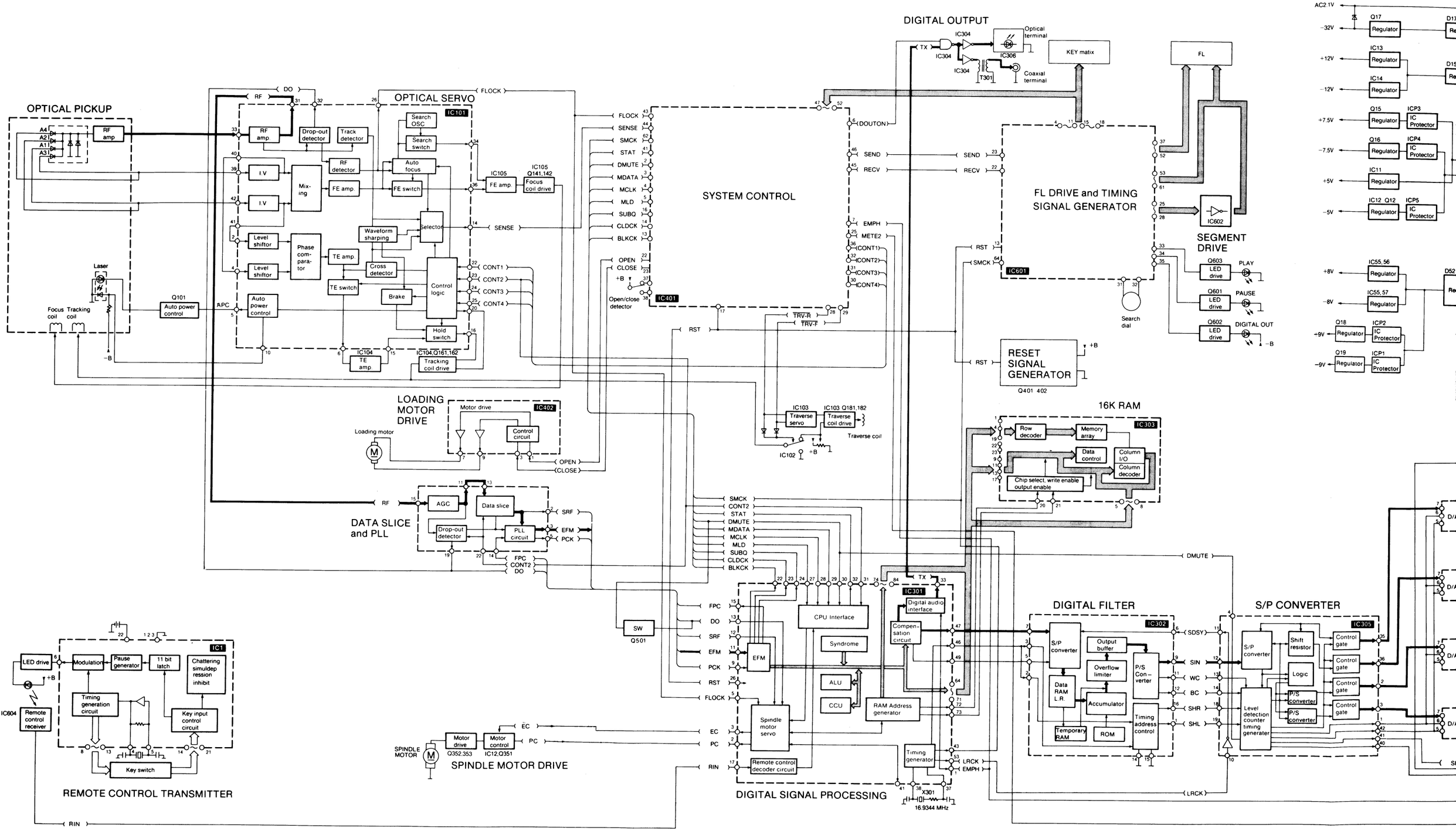
Ref. No.	Part No.	Value.
R845	ERDS2TJ182	1.8K 1/4
R846	ERDS2TJ182	1.8K 1/4
R847	ERDS2TJ821	820 1/4
R848	ERDS2TJ821	820 1/4
R849	ERDS2TJ182	1.8K 1/4
R850	ERDS2TJ182	1.8K 1/4
R851	ERDS2TJ101	100 1/4
R852	ERDS2TJ101	100 1/4
R853	ERDS2TJ471	470 1/4
R854	ERDS2TJ471	470 1/4
R855	ERDS2TJ472	4.7K 1/4
R856	ERDS2TJ472	4.7K 1/4
R857	ERDS2TJ332	3.3K 1/4
R858	ERDS2TJ332	3.3K 1/4
R859	ER010TKD1202	12K 10
R860	ER010TKD1202	12K 10
R861	ER010TKD1202	12K 10
R862	ER010TKD1202	12K 10
R863	ER010TKD1202	12K 10
R864	ER010TKD1202	12K 10
R865	ER010TKD1202	12K 10
R866	ER010TKD1202	12K 10
R867	ERDS2TJ102	1K 1/4
R868	ERDS2TJ104	100K 1/4
R869	ERDS2TJ101	100 1/4
R870	ERDS2TJ101	100 1/4
R871	ERDS2TJ103	10K 1/4
R872	ERDS2TJ103	10K 1/4
R873	ERDS2TJ123	12K 1/4
R874	ERDS2TJ123	12K 1/4
R875	ERDS2TJ104	100K 1/4
R876	ERDS2TJ104	100K 1/4
R877	ERDS2TJ330	33 1/4
R878	ERDS2TJ330	33 1/4
R879	ERDS2TJ332	3.3K 1/4
R880	ERDS2TJ332	3.3K 1/4
R881	ERDS2TJ100	10 1/4
R882	ERDS2TJ100	10 1/4
R883	ERDS2TJ102	1K 1/4
R884	ERDS2TJ102	1K 1/4
R885	ERDS2TJ222	2.2K 1/4
R886	ERDS2TJ222	2.2K 1/4
R887	ERDS2TJ680	68 1/4
R888	ERDS2TJ680	68 1/4
R889	ERDS2TJ470	47 1/4
R890	ERDS2TJ470	47 1/4
R891	ERDS2TJ332	3.3K 1/4
R892	ERDS2TJ332	3.3K 1/4
R893	ERDS2TJ332	3.3K 1/4
R894	ERDS2TJ332	3.3K 1/4
R895	ERDS2TJ104	100K 1/4
R896	ERDS2TJ104	100K 1/4
R897	ERDS2TJ222	2.2K 1/4
R898	ERDS2TJ222	2.2K 1/4
R899	ERDS2TJ102	1K 1/4
R900	ERDS2TJ102	1K 1/4
R901	ERDS2TJ103	10K 1/4
R1002	ER0S2TKG1003	100K 1/4
R1003	ER0S2TKG1003	100K 1/4
R1004	ER0S2TKG1003	100K 1/4

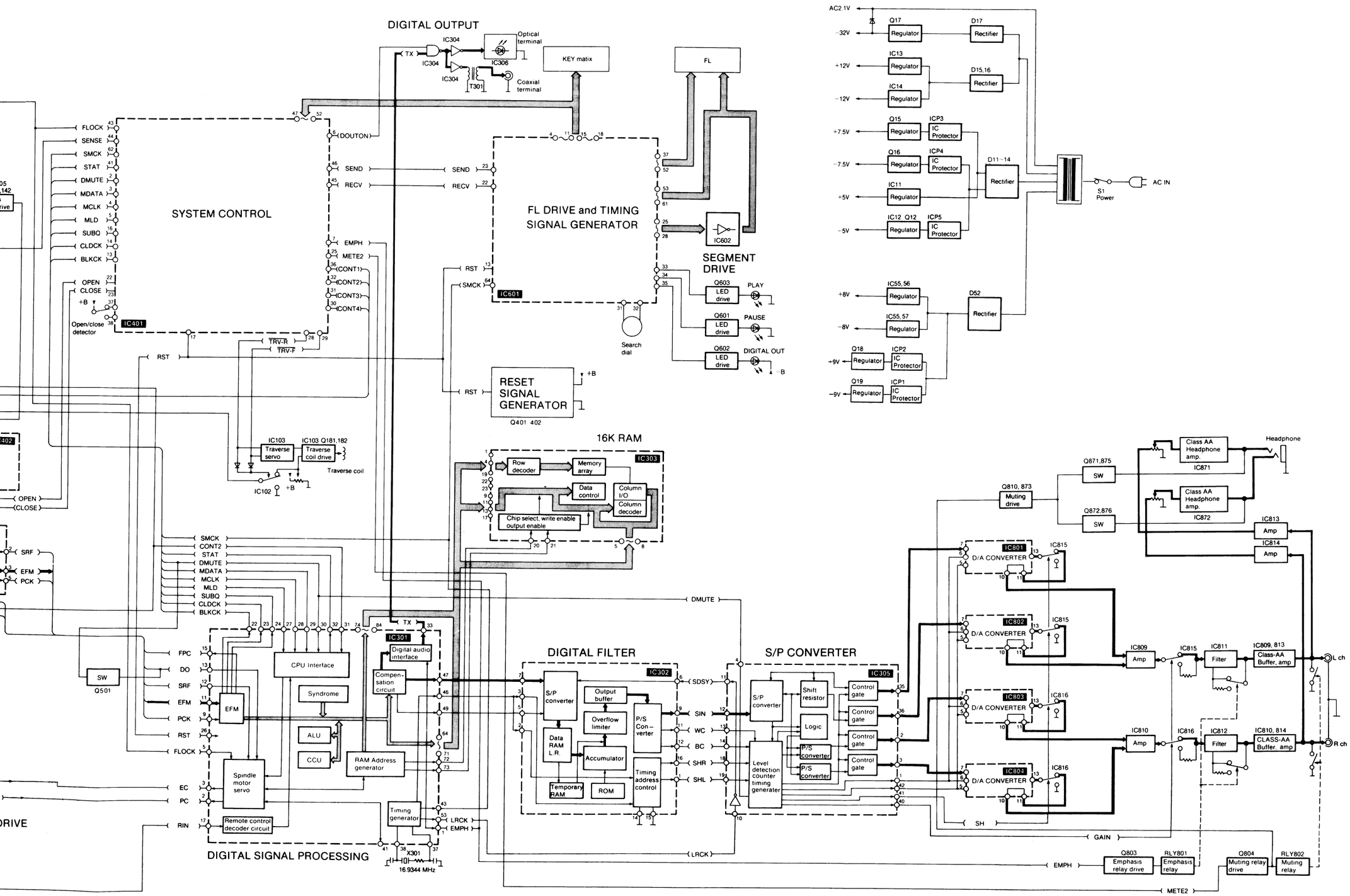
CAPACITORS(VALUE,VOLTAGE)

Ref. No.	Part No.	Value.
C1 ⚠	ECKDKC103PF2	0.01 125
C11 ⚠	ECFTD103KXL	0.01 25
C12 ⚠	ECFTD103KXL	0.01 25
C14	ECFF1E104ZF	0.1 25
C15	ECEA1CU332	3300 16
C16	ECEA1CU332	3300 16
C17	ECEA1CU470	47 16
C18	ECEA1CU470	47 16
C19	ECEA0JS331	330 6.3
C20	ECEA0JS331	330 6.3
C21	ECFF1E104ZF	0.1 25
C22	ECFF1E104ZF	0.1 25
C27	ECKD1H102KB	0.001 50
C28	ECKD1H102KB	0.001 50
C31	ECEA1AU101	100 10
C32	ECEA1AU101	100 10
C33	ECEA25V330V	330 25
C34	ECEA25V330V	330 25
C37	ECEA1HK010	1 50
C38	ECEA1HK010	1 50
C39	ECEA50V330V	330 50
C40	ECEA50V330V	330 50
C43	ECEA1HK010	1 50
C61 ⚠	ECFTD103KXL	0.01 25
C62 ⚠	ECFTD103KXL	0.01 25
C63	UKS1C222M1AA	0.0022 16
C64	UKS1C222M1AA	0.0022 16
C65	ECQM1H103JZ	0.01 50
C66	ECQM1H103JZ	0.01 50
C67	ARA1A470M0T	47 10
C68	ARA1A470M0T	47 10
C69	REC1A101M0T	100 10
C70	REC1A101M0T	100 10
C83	ECEA1AU101	100 10
C84	ECEA1AU101	100 10
C86	ECCD1H120KC	12P 50
C87	REC1C101M0T	100 16
C88	REC1C101M0T	100 16
C94	ECCD1H120KC	12P 50
C95	ECEA1CU331	330 16
C101	ECQV1H104JZ	0.1 50
C102	ECKD1H102KB	0.001 50
C103	ECKD1H102KB	0.001 50
C104	ECKD1H681K	680P 50
C105	ECKD1H471KB	470P 50
C106	ECKD1H471KB	470P 50
C107	ECCD1H220K	22P 50
C108	ECEA1HK0R1	0.1 50
C109	ECEA1HK010	1 50
C110	ECQV1H104JZ	0.1 50
C111	ECEA1HK100	10 50
C112	ECEA1CKS100	10 16
C113	ECEA1HK010	1 50
C114	RCBS1C182MXY	0.0018 16
C115	ECKD1H682KB	0.0068 50
C116	ECQM1H333JZ	0.033 50
C117	RCBS1H221KBY	220P 50
C118	ECEA1HK010	1 50
C119	ECEA0JK220	22 6.3
C120	ECKD1H681K	680P 50
C121	ECFTD103KXL	0.01 25
C122	ECBT1H101KB5	100P 50
C123	ECBT1H101KB	100P 50
C124	ECKD1H222KB	0.0022 50
C125	ECEA0JK470	47 6.3
C126	ECEA0JK470	47 6.3
C127	ECKD1H102KB	0.001 50
C128	ECKD1H102KB	0.001 50
C129	ECKD1H681K	680P 50
C131	ECEA0JK221	220 6.3
C141	ECQM1H153JZ	0.015 50
C142	ECQM1H122JZ	0.0012 50
C143	ECQM1H473JZ	0.047 50
C144	ECEA1HKN2R2	2.2 50
C145	ECEA1HKNR22	0.22 50
C161	ECQM1H153JZ	0.015 50
C162	ECKD1H681K	680P 50
C163	ECQM1H103JZ	0.01 50
C164	ECEA1HKN3R3	3.3 50
C165	ECEA1HKN0R1	0.1 50
C168	ECEA1CKN100	10 16
C169	RCBS1C103MYY	0.01 16
C181	ECQM1H474JZ	0.47 50
C182	RCBS1H221KBY	220P 50
C183	ECQM1H682JZ	0.0068 50
C184	ECEA1HKN010	1 50
C186	ECQM1H224JZ	0.22 50
C187	ECEA1HKNR47	0.47 50
C301	ECFF1E104ZF	0.1 25
C302	ECFF1E104ZF	0.1 25
C303	ECEA0JK470	47 6.3
C304	ECFF1E104ZF	0.1 25

Ref. No.	Part No.	Value.
C305	ECFF1E104ZF	0.1 25
C306	ECFF1E104ZF	0.1 25
C307	ECCD1H220K	22P 50
C308	ECCD1H070CC	7P 50
C309	ECFF1E104ZF	0.1 25
C310	ECFF1E104ZF	0.1 25
C311	ECFTD103KXL	0.01 25
C312	ECFF1E104ZF	0.1 25
C313	ECFF1E104ZF	0.1 25
C314	ECFF1E104ZF	0.1 25
C351	ECKD1H102KB	0.001 50
C352	ECKD1H102KB	0.001 50
C353	ECKD1H102KB	0.001 50
C401	ECFF1E104ZF	0.1 25
C402	ECEA0JK470	47 6.3
C403	ECFF1E104ZF	0.1 25
C405	ECFF1E104ZF	0.1 25
C501	ECQM1H104JZ	0.1 50
C502	ECFF1E104ZF	0.1 25
C503	ECEA1CKS100	10 16
C504	ECFF1E104ZF	0.1 25
C505	ECFF1E104ZF	0.1 25
C506	ECCD1H150KC	15P 50
C507	ECKD1H102KB	0.001 50
C508	ECEA1CKN100	10 16
C509	ECCD1H100KC	10P 50
C510	ECQM1H104JZ	0.1 50
C511	ECEA1HUR47	0.47 50
C512	ECKD1H681K	680P 50
C513	ECKD1H681K	680P 50
C514	ECQM1H154JZ	0.15 50
C515	ECQM1H153JZ	0.015 50
C516	ECEA1HKN2R2	2.2 50
C517	ECKD1H471KB	470P 50
C518	ECKD1H472KB	0.0047 50
C601	RCBS1C103MYY	0.01 16
C602	ECEA1HKS100	10 50
C606	ECFF1E104ZF	0.1 25
C801	REC1A101M0T	100 10
C802	REC1A101M0T	100 10
C803	REC1A101M0T	100 10
C804	REC1A101M0T	100 10
C805	ECQP2A271J	270P 100
C806	ECQP2A271J	270P 100
C807	ECQP2A271J	270P 100
C808	ECQP2A271J	270P 100
C809	ECQP2A392J	0.0039 100
C810	ECQP2A392J	0.0039 100
C811	ECQP1271JZ	270P 100
C812	ECQP1271JZ	270P 100
C813	ECQP1103JZ	0.01 100
C814	ECQP1103JZ	0.01 100
C815	ECQP1122JZ	0.0012 100
C816	ECQP1122JZ	0.0012 100
C817	ARA1AN330M0T	330 10
C818	ARA1AN330M0T	330 10
C819	ECQP1102JZ	0.001 100
C820	ECQP1102JZ	0.001 100
C821	ECKD1H272KB	0.0027 50
C822	ECKD1H272KB	0.0027 50
C823	ARA1A470M0T	47 10
C824	ARA1A470M0T	47 10
C825	ARA1A470M0T	47 10
C826	ARA1A470M0T	47 10
C827	ECFTD103KXL	0.01 25
C828	ECFTD103KXL	0.01 25
C829	ECKD1H102KB	0.001 50
C831	REC0J470M0T	470 6.3
C832	REC0J470M0T	470 6.3
C835	ECFTD103KXL	0.01 25
C836	ECFTD103KXL	0.01 25
C837	ECEA0JK220	22 6.3
C871	ARA1EN3R3M0	3.3 25
C872	ARA1EN3R3M0	3.3 25
C873	ECQM1H103KF	0.01 50
C874	ECQM1H103KF	0.01 50
C875	ARA1A470M0T	47 10
C876	ARA1A470M0T	47 10
C878	ECFTD103KXL	0.01 25

■ BLOCK DIAGRAM




DIGITAL OUTPUT
IC304
Optical terminal
TX
IC304
IC306
IC304
T301
Coaxial terminal
KEY matix
FL
SYSTEM CONTROL
FL DRIVE and TIMING SIGNAL GENERATOR
IC602
SEGMENT DRIVE
IC601
Q603 LED drive
PLAY
Q601 LED drive
PAUSE
Q602 LED drive
DIGITAL OUT
Search dial
FLOCK
SENSE
SMCK
STAT
DMUTE
MDATA
MCLK
MLD
SUBQ
CLDCK
BLKCK
OPEN
CLOSE
+B
Open/close detector
IC401
DOUTON
SEND
RECV
EMPH
METE2
CONT1
CONT2
CONT3
CONT4
RST
TRV-R
TRV-F
RESET SIGNAL GENERATOR
Q401 402
IC103
Traverse servo
IC103 Q181,182
Traverse coil drive
Traverse coil
IC102
16K RAM
IC303
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable output enable
SRF
EFM
PCK
SMCK
CONT2
STAT
DMUTE
MDATA
MCLK
MLD
SUBQ
CLDCK
BLKCK
TX
IC301
Digital audio interface
DMUTE
SW
Q501
FPC
DO
SRF
EFM
PCK
RST
FLOCK
EC
PC
RIN
CPU Interface
Syndrome
ALU
CCU
EFM
Spindle motor servo
Remote control decoder circuit
Compen-sation circuit
RAM Address generator
Timing generator
LRCK
EMPH
X301
16.9344 MHz
DIGITAL SIGNAL PROCESSING
DIGITAL FILTER
IC302
S/P converter
Output buffer
Overflow limiter
Data RAM L,R.
Accumulator
Temporary RAM
ROM
P/S Con-verter
Timing address control
SDSY
SIN
WC
BC
SHR
SHL
S/P CONVERTER
IC305
S/P converter
Shift resistor
Logic
P/S converter
P/S converter
Level detection counter timing generater
Control gate
Control gate
Control gate
Control gate
SH
GAIN
LRCK
EMPH
METE2
AC2.1V
-32V
+12V
-12V
+7.5V
-7.5V
+5V
-5V
+8V
-8V
+9V
-9V
Q17 Regulator
D17 Rectifier
IC13 Regulator
IC14 Regulator
D15,16 Rectifier
Q15 Regulator
ICP3 IC Protector
Q16 Regulator
ICP4 IC Protector
IC11 Regulator
IC12 Q12 Regulator
ICP5 IC Protector
D11-14 Rectifier
S1 Power
AC IN
IC55,56 Regulator
IC55,57 Regulator
D52 Rectifier
Q18 Regulator
ICP2 IC Protector
Q19 Regulator
ICP1 IC Protector
Headphone
Q871,875 SW
Class AA Headphone amp.
IC871
Q872,876 SW
Class AA Headphone amp.
IC872
Q810, 873 Muting drive
IC813 Amp
IC814 Amp
IC801 D/A CONVERTER
IC802 D/A CONVERTER
IC803 D/A CONVERTER
IC804 D/A CONVERTER
IC815
IC816
IC809 Amp
IC810 Amp
IC815
IC816
IC811 Filter
IC812 Filter
IC809, 813 Class-AA Buffer, amp
IC810, 814 CLASS-AA Buffer, amp
L ch
R ch
Q803 Emphasis relay drive
RLY801 Emphasis relay
Q804 Muting relay drive
RLY802 Muting relay

■ TERMINAL FUNCTION OF LSI

• MN6622 (Digital Signal Processing: EFM Decoder, Error Correction ,CLV Servo)

Pin No.	Mark	I/O	Function
1	MEMP	I	Emphasis signal input
2	PC	O	Spindle motor "ON" signal(ON at "L")
3	EC	O	Spindle motor drive signal
4	FG	I	Not connected
5	TTF	I	Spindle motor free run
6	FLAG0	O	Not connected
7	IPFLAG	O	Not connected
8	FLAG6	O	Not connected
9	PCK	I	PLL extract clock input(4.2336MHz)
10	VDD	I	Power supply (connected to +5V)
11	EFM	I	EFM signal input (PLL)
12	SRF	I	EFM signal input (DSL)
13	DO	I	Drop-out signal ("H" at drop-out)
14	CLVS	O	Not connected
15	EPC	O	PLL frequency comparison signal
16	BSSEL	O	Not connected
17	RIN	I	Remote control signal input
18	FSL	I	Not used (connected to GND)
19	SLEEP	I	Not used (connected to GND)
20	SUBC	O	Not connected
21	SBCK	I	Not connected
22	BLKCK	O	Sub-code block(Q-data) clock (75Hz)
23	CLDCK	O	Sub-code frame(Q-data) clock (7.35kHz)
24	SUBQ	O	Sub-code(Q-data) output
25	CRC	O	Not connected
26	RST	O	Reset signal input ("L"=Reset)
27	MLD	I	Data input (command load)
28	MCLK	I	Data clock input (command clock)
29	MDATA	I	Data input (command data)
30	DMUTE	I	Muting control (Not used, connected to GND)
31	TRON	I	Tracking servo "ON" signal (ON at "L")
32	STAT	O	Processing condition (CRC,OTC,CLVOK,TT,STOP) output
33	TX	O	Digital output signal
34	TSTR	I	Not used (connected to +5V)
35	TEST	I	Not used (connected to +5V)
36	VSS	I	GND terminal
37	X2	O	Clock output (16.9344MHz)
38	X1	I	Clock input (16.9344MHz)
39	SEL	I	Not used (connected to GND)
40	LDG/ WDCKS	O	Deglitch signal at Lch/ word clock for serial DAC
41	RDG	O	Not connected
42	DEMPH	O	Not connected
43	SMCK	O	Clock output (4.2336MHz)
44	WS	O	Not connected
45	SRCK	O	Not connected
46	XCK	O	Clock output (16.9344MHz)
47	DA15/ SRDATA	O	DA parallel output(MSB)/ Serial data output(MSB FIRST)
48	DA14/ SRDATA	O	Not connected
49	DA13/ SCK	O	DA Parallel output/ serial data output bit clock
50	DA12/ WDCK	O	Not connected
51	DA11/ BYTCK	O	Not connected
52	VSS	I	GND terminal
53	DA10/R/L	O	DA parallel output/ R/L signal (R at "H")
54 – 56	DA9 – DA7	O	Not connected
57	DA6	O	Not used (connected to GND)
58 – 63	DA5 – DA0	O	Not connected
64 – 71	D7 – D0	I/O	16K RAM DATA
72	RAMOE	O	16K RAM OE signal
73	RAMWE	O	16K RAM WE signal
74 – 84	RAMA0 – RAMA10	O	16K RAM address

• MN53010PEH (Serial/Parallel converter)

Pin No.	Mark	I/O	Function
1	WCO	O	Output data word clock (DALO,DBLO,DARO,DBRO)
2	DARO	O	Rch data output, (+)terminal
3	DBRO	O	Rch data output, (-)terminal
4	RST	O	Reset output data to "0"
5	VDD	I	Power supply (connected to +5V)
6	VSS	I	GND terminal
7	F2DAC	I	"H": 2DAC 18-bit "L": 2DAC 17-bit
8	FLOAT	I	"H": 4DAC 18-bit "L": 4DAC 17-bit
9	PHASE	I	"H": Phase inversion "L": Normal mode
10	LRCK	I	Inverter input
11	LRCK	O	LRCK signal inverter output
12	SIN	I	Data input
13	WCI	I	Input data word clock
14	BCI	I	Input data bit clock
15	VSS	I	GND terminal
16	NC	---	Not connected
17	VDD	I	Power supply (connected to +5V)
18	SHR	I	Rch Deglitcher signal

Pin No.	Mark	I/O	Function			
18	SHR	I	Rch Deglitcher signal			
19	SHL	I	Lch Deglitcher signal			
20 – 31	NC	---	Not connected			
			NORMAL MODE delay: 180ms	TEST MODE delay: 1.45ms	TEST MODE delay: 0.73ms	TEST MODE delay: 0ms
32	NTEST1	I	H	L	H	L
33	NTEST2	I	H	H	L	L
34	NTEST3	I	"H": Normal mode "L": Reset			
35	DALO	O	Lch data output, (+)terminal			
36	DBLO	O	Rch data output, (-)terminal			
37	VDD	I	Power supply (connected to +5V)			
38	VSS	I	GND terminal			
39	NC	---	Not connected			
40	GAIN	O	Gain selector signal H: 0~-12dB L: below-12dB			
41	SH	O	Deglitch signal H: Sample L: Hold			
42	BCO	O	Output data bit clock			

• AN8371S (Data slice and PLL)

Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to -5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D.GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free run frequency adjusting current input (not connected)
8	VC1	I	Capacitor connection for VCO oscillator frequency
9	VC2	I	Capacitor connection for VCO oscillator frequency
10	VR	I	Resistor connection for VCO oscillator frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter connection
13	PL2	I	PLL loop filter connection
14	FPC	I	Frequency comparison error signal input
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC output
17	AGC	I	ARF signal input for AGF drop-out detection input
18	AC	I	Loop filter for AGC connected
19	DO	O	Drop-out detection pulse output
20	A.GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicing
22	SLC	I	Slicing level control signal input
23	FC1	I	Filter capacitor for data slicer connected
24	FC2	I	Filter capacitor for data slicer connected

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to -5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE(+)	I	Phase difference to voltage conversion (+)
9	TE(-)	I	Phase difference to voltage conversion (-)
10	APC(-)	I	Laser power inversion input
11	C.MEM	I	Capacitor connection for phase difference memory
12	APC(+)	I	Laser power non inversion input
13	VREFE	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Trackcrossing speed control output (not used, (Not connected)
18	C.MSP	I	Trackcrossing reference speed setting capacitor connection (Not connected)
19	C.AF	I	Auto focus timer capacitor connection
20	KICK	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input (FOON Focus servo "ON" signal)

Pin No.	Mark	I/O	Function
23	CNT2	I	Control input (TRON Tracking servo ON signal)
24	CNT3	I	Control input (KICKF Kick direction [Foward] command)
25	CNT4	I	Control input (KICKR Kick direction [Reverse] command)
26	F.LOCK	O	Focus lock signal output
27	C.FBDO	O	Capacitor connection for inversion RF high detection
28	C.SBDO	O	Capacitor connection for inversion RF low detection
29	C.SBRT	O	Capacitor connection for non-inversion RF slow detection
30	C.FBRT	O	Capacitor connection for non-inversion RF fast detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RF IN	I	RF signal input
34	S.OUT	O	Focus search signal output
35	C.LW	I	Capacitor connection for triangular wave generation
36	FE.OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE.REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detection current input (B)
40	IVB	O	Current/ voltage conversion (B)
41	IVA	O	Current/ voltage conversion (A)
42	PDA	I	Photo detection current input (A)

• YM3404 (Digital filter)

Pin No.	Mark	I/O	Function
1	SHL	O	1DAC(ST="L"): Lch Deglitcher signal 2DAC(ST="H"): L/Rch Deglitcher signal
2	X0	O	Clock output
3	X1	I	Clock input
4	VDD2	I	Power supply (connected to +5V)
5	BCI	I	Bit clock input (input data)
6	SDSY	I	R/L signal
7	SDI	I	Data input
8	VCC1	I	Power supply (connected to +5V)

Pin No.	Mark	I/O	Function
9	DLO	O	1DAC(ST="L"): L/Rch data output terminal 2DAC(ST="H"): Lch data output terminal
10	RDO	O	Rch data output (not connected)
11	WCO	O	Output data word clock
12	BCO	O	Bit clock output (output data)
13	VSS	I	GND terminal
14	ST	I	1DAC/2DAC selector terminal
15	FEN	I	System clock selector terminal
16	SHR	O	1DAC(SP="L"): Rch deglitch signal

• MN1554PEF (System Control)

Pin No.	Mark	I/O	Function
1	GND	I	GND terminal
2	DMUTE	O	Muting control
3	MDATA	O	Command data output
4	MCLK	O	Data clock output (command clock)
5	MLD	O	Data output (command load)
6	DOUTON	O	Optical output control signal
7	EMPH	O	Emphasis signal output
8	P11	I	Not connected
9	P12	I	Not connected
10	P13	I	Not connected
11	SYNC	O	Not connected
12	SIRQ	I	Not used (connected to +5V)
13	BLKCK	I	Sub-code block(Q data) clock input (75Hz)
14	CLDCK	I	Sub-code block(Q data) clock input (7.35KHz)
15	SBO	I	Not connected
16	SUBQ	I	Sub-code(Q data) input
17	RST	I	Reset signal input
18	P20	O	Not used (connected to +5V)
19	P21	O	Not used (connected to +5V)
20	P22	O	Not used (connected to +5V)
21	P23	O	Not used (connected to +5V)
22	CLOSE	O	Loading motor "Close" command
23	OPEN	O	Loading motor "Open" command
24	P32	O	Not connected
25	MUTE2	O	Muting control
26	SEEK	O	Traverse serro control
27	P41	O	Not connected
28	TRV.R	O	Traverse "Reverse" command signal
29	TRV.F	O	Traverse "Forward" command signal
30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [reverse] command)
31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [forward] command)
32	CNT2	O	Optical servo IC control (TRON: Tracking servo)

Pin No.	Mark	I/O	Function
33	VDD	I	Power supply (connected to +5V)
34	VR.R	O	Not connected
35	VR.F	O	Not connected
36	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
37	P60	I	Disc holder "Open/close" detection
38	P61	I	Disc holder "Open/close" detection
39	P62	I	Not used (connected to GND)
40	P63	I	Not used (connected to GND)
41	STAT	I	Processing status input from signal processing LSI
42	COMP	O	TOC reading control (ON at "L")
43	FLOCK	I	Optical servo condition(focus) input
44	SENSE	I	Optical servo condition(track cross) input
45	RECK	I	Data receipt command signal
46	SEND	I	Data transmission command
47	ACK	I	Data discrimination signal
48	CLK	I	Data lock signal
49	D0	I	Key scan
50	D1	I	Key scan
51	D2	I	Key scan
52	D3	I	Key scan
53	PA0	I	
54	PA1	I	Not connected
55	PA2	I	
56	PA3	I	Not connected
57	PB0	I	Not connected
58	PB1	I	Key scan
59	PB2	I	Key scan
60	PB3	I	Key scan
61	OSC2	I	Clock terminal
62	OSC1	I	Clock input
63	X1	I	Optical servo condition input
64	X0	O	Not connected

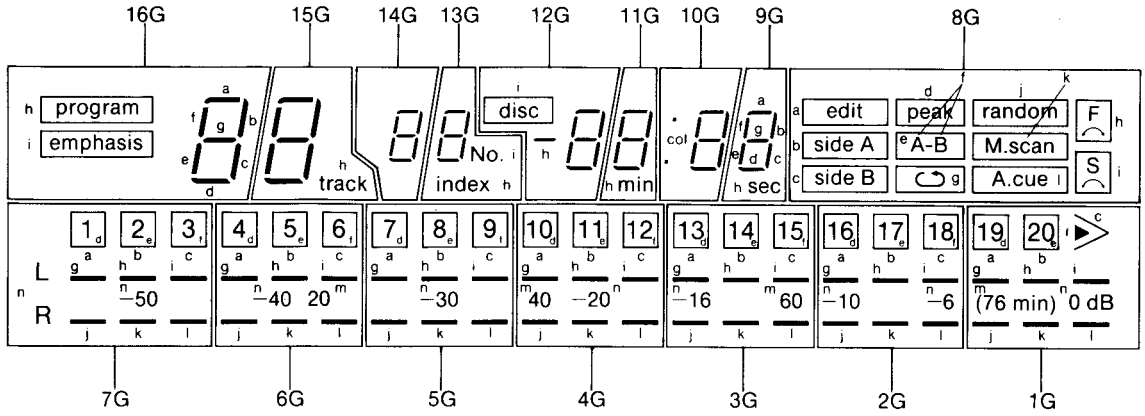
• MN15283PEE (FL Drive and Timing Signal Generator)

Pin No.	Mark	I/O	Function
1	VSS	I	GND terminal
2	XO	---	Not connected
3	X1	I	Not used (connected to GND)
4 7	D0 D3	I	Key scan input
8 11	11 13	I	Key scan input
12	SYNC	---	Not connected
13	RST	I	Reset signal input
14	IRO	---	Not connected
15 18	50 53	I	Key scan input
19	SBT	---	Not connected
20	SDD	---	Not connected
21	20	I	Key scan input
22	RECV	O	Receiving data command signal
23	SEND	O	Receiving data command signal
24	P23	---	Not connected

Pin No.	Mark	I/O	Function
25 28	P30 P33	O	FL anode signal
29	P40	I	Key scan input
30	P41	I	Key scan input
31	P42	I	Not connected
32	P43	I	Not connected
33	PLAY	O	"Play" indicator LED drive signal
34	PAUSE	O	"Pause" indicator LED drive
35	DIGITAL OUT	O	Digital output indicator LED drive
36	VPP	I	Connected to -32V
37 52	D0 DF	O	FL grid signal
53 61	S8 S0	O	FL anode signal
62	VDD	I	Connected to +5V
63	OSC2	I	Clock terminal
64	OSC1	I	Clock input

■ INTERNAL CONNECTION OF FL

• Grid connection diagram



• Anode connection table

	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	a	a	a	a	a	a	a	a	edit	1	4	7	10	13	16	19
b	b	b	b	b	b	b	b	b	side A	2	5	8	11	14	17	20
c	c	c	c	c	c	c	c	c	side B	3	6	9	12	15	18	>
d	d	d	d	d	d	d	d	d	peak	1	4	7	10	13	16	19
e	e	e	e	e	e	e	e	e	A-	2	5	8	11	14	17	20
f	f	f	f	f	f	f	f	f	B	3	6	9	12	15	18	▶
g	g	g	g	g	g	g	g	g	↻	—1	—4	—7	—10	—13	—16	—19
h	program	track	-	index	—	min	col	sec	F	—2	—5	—8	—11	—14	—17	—20
i	emphasis	-	-	No.	disc	-	-	-	S	—3	—6	—9	—12	—15	—18	—21
j	-	-	-	-	-	-	-	-	random	—22	—25	—28	—31	—34	—37	—40
k	-	-	-	-	-	-	-	-	M.scan	—23	—26	—29	—32	—35	—38	—41
l	-	-	-	-	-	-	-	-	A.cue	—24	—27	—30	—33	—36	—39	—42
m	-	-	-	-	-	-	-	-	-	-	20	-	40	60	-	76 min
n	-	-	-	-	-	-	-	-	-	L —50 R	—40	—30	—20	—16	—10 —6	0 dB

Printed in Japan
S880110800TK/HS

ORDER NO. HAD 8801018C0-A

Compact Disc Player

SL-P770

DEUTSCH

ELEKTRISCHE JUSTIERUNG

Meßinstrumente und Spezialwerkzeuge

- Servo-Verstärkungs-Justierer (SZZP1017F)
- Testplatten
  Testplatte (SZZP1014F) alter oder neuer Typ
  Inspektions-Testplatte (SZZP1054C)
  Ungleichmäßige Platte (SZZP1056C)
  Schwarzbandplatte (SZZP1057C)
- Gewöhnliche Platte
- Zweikanal-Oszilloskop (mit Trigger) von 30 MHz oder mehr
- Niederfrequenz-Oszillator
- Zwischenstecker (SZZP1032F)
- Filter

Justierverfahren

Schritt 1: Das Gehäuse entfernen.

Schritt 2: Die einzelnen Regelwiderstände provisorisch einstellen.

Schritt 3: Beste Augen-(PD-Balance)-Justierung

Schritt 4: Den Servo-Verstärkungs-Justierer anschließen.

Schritt 5: Fokus-Verstärkungs-Justierung

Schritt 6: Spurlagen-Verstärkungs-Justierung

Schritt 7: Fokus-Offset-Justierung

Schritt 8: Spurlagen-Offset-Justierung

Schritt 9: Spurlagen-Offset-Balance-Justierung

Schritt 10: Den Servo-Verstärkungs-Justierer abtrennen.

Schritt 11: PLL-Justierung

Schritt 12: Nach der Justierung den Betrieb prüfen.

PROVISORISCHE JUSTIERUNG DER EINZELNEN REGELWIDERSTÄNDE

Hinweis:
Wenn bei einer Platte Überspringungen auftreten oder Wiedergabe nicht möglich ist, die einzelnen Regelwiderstände wie abgebildet provisorisch einstellen.

BESTE AUGEN-(PD-BALANCE)-JUSTIERUNG

1. Kanal1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV
   KIPP .....0,5 μsec.
   EINGANG .....Wechselstrom
2. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
3. Den Spieler auf Wiedergabe schalten.
4. **VR101** so justieren, daß das Augenmuster des HF-Signals maximal gestreckt ist.
5. Den Netzschalter des Spielers ausschalten.

FOKUS-VERSTÄRKUNGS-JUSTIERUNG

1. Den Servo-Verstärkungs-Justierer anschließen.
2. Den Wahlschalter des Servo-Verstärkungs-Justierers auf **2** und den ON-OFF-Schalter auf **ON** stellen.
3. Den Niederfrequenz-Oszillator auf eine Frequenz von **750 Hz** und eine Ausgangsspannung von **100 mVs-s** einstellen. Dann den Oszillator an **OSC** (+) und **GND** (−) des Servo-Verstärkungs-Justierers anschließen.
4. Kanal 1 und Kanal 2 des Oszilloskops an **TP1** und **TP2** des Servo-Verstärkungs-Justierers anschließen. (**TP3** ist die Masseklemme.)
   Oszilloskop-Einstellung:
   VOLT .....200 mV (beide Kanäle)
   KIPP .....1 msec.
   EINGANG .....Gleichstrom
5. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
6. Den Spieler auf Wiedergabe schalten.
7. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"2"** auf **"3"** stellen.
8. Auf dem Oszilloskop werden **750 Hz**-Signale angezeigt. **VR104** justieren, bis die Wellenform-Amplituden beider Kanäle identisch sind.
9. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"3"** auf **"2"** stellen.

SPURLAGEN-VERSTÄRKUNGS-JUSTIERUNG

1. Die Oszilloskop-Einstellung und der Anschluß sind die gleichen wie oben.
2. Den Niederfrequenz-Oszillator auf eine Frequenz von **1,0 kHz** und eine Ausgangsspannung von **100 mVs-s** stellen.
3. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"2"** auf **"1"** stellen.
4. Auf dem Oszilloskop werden **1,0 kHz**-Signale angezeigt. **VR102** justieren, bis die Wellenform-Amplituden beider Kanäle identisch sind.
5. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"1"** auf **"2"** stellen.
6. Den Netzschalter des Spielers ausschalten.

FOKUS-OFFSET-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Kanal 2 des Oszilloskops an **TJ102** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV (beide Kanäle)
   KIPP .....0,5 msec.
   EINGANG .....Wechselstrom (Kanal 1), Gleichstrom (Kanal 2)
   BETRIEBSART ....NORM (Schaltgriff auf Kanal 1)
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1057C) einsetzen.
3. Den Spieler auf Wiedergabe schalten.
4. Die Wellenform von Kanal 1 und Kanal 2 auf dem Oszilloskop prüfen und **VR105** so justieren, daß die Wellenform um den Triggerpunkt so wie in der Abbildung wird.

SPURLAGEN-OFFSET-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Kanal 2 des Oszilloskops an **TJ101** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV (beide Kanäle)
   KIPP .....0,5 msec.
   EINGANG .....Wechselstrom (Kanal 1), Gleichstrom.(Kanal 2)
   BETRIEBSART ....NORM (Schaltgriff auf Kanal 1)
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1057C) einsetzen.
3. Den Spieler auf Wiedergabe schalten.
4. Die Wellenform von Kanal 1 und Kanal 2 auf dem Oszilloskop prüfen und **VR103** so justieren, daß die Wellenform um den Triggerpunkt so wie in der Abbildung wird.

SPURLAGEN-OFFSET-BALANCE-JUSTIERUNG

1. Den Niederfrequenz-Oszillator auf eine Frequenz von **1 kHz** und eine Ausgangsspannung von **200 mVs-s** einstellen. Dann den Oszillator an **OSC** (+) und **GND** (−) des Servo-Verstärkungs-Justierers anschließen.
2. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....500 mV
   KIPP .....0,5 msec.
   EINGANG .....Wechselstrom
3. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
4. Den Spieler auf Wiedergabe schalten.
5. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"2"** auf **"1"** stellen.
6. **VR106** so justieren, daß die Ausgangs-Wellenform wie abgebildet wird (Jitter ist minimiert).
7. Den Wahlschalter des Servo-Verstärkungs-Justierers von **"1"** auf **"2"** stellen.
8. Den Netzschalter des Spielers ausschalten.
9. Den Servo-Verstärkungs-Justierer abtrennen und den Kurzschlußstecker von CN102 an der ursprünglichen Position einstecken.

PLL-JUSTIERUNG

1. Kanal 1 des Oszilloskops an die **LINE OUT-Buchse** (entweder linker oder rechter Kanal) und an **Masse** anschließen.
   Oszilloskop-Einstellung:
   VOLT .....1 V
   KIPP .....1 msec.
   EINGANG .....Gleichstrom
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1054C) einsetzen.
3. **Spur Nr. 6 (Keil 0,7 mm)** der Testplatte abspielen.
4. Die auf dem Oszilloskop angezeigte Wellenform prüfen und **VR501** in den folgenden Schritten justieren.
   Schritt 1. **VR501** langsam im Uhrzeigersinn drehen und den Punkt beobachten, an dem die Wellenform auf dem Oszilloskop anfängt zu verzerren.
   Schritt 2. **VR501** langsam entgegen dem Uhrzeigersinn drehen und den Punkt beobachten, an dem die Wellenform auf dem Oszilloskop anfängt zu verzerren.
   Schritt 3. **VR501** auf die Mitte zwischen den in den obigen Schritten **"1"** und **"2"** beobachteten Punkten einstellen.

PRÜFUNG DES WIEDERGABEBETRIEBS NACH DER JUSTIERUNG

Prüfung des Überspring-Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Skip-Taste drücken, um den Überspring-Suchlauf zu prüfen (in Vorwärts- und Rückwärtsrichtung).

Prüfung des manuellen Suchlaufs

1. Eine gewöhnliche Platte abspielen.
2. Die Taste für manuellen Suchlauf drücken und prüfen, ob einwandfreier manueller Suchlauf mit niedriger und hoher Geschwindigkeit möglich ist (in Vorwärts- und Rückwärtsrichtung).

Prüfen auf Defekte

1. Die Testplatte (SZZP1054C) abspielen.
2. Die **Spur Nr. 6 (Keil 0,7 mm)** wiedergeben und prüfen, daß kein Tonausfall oder Rauschen auftritt.
3. Die **Spur Nr. 13 (schwarzer Punkt 0,7 mm)** wiedergeben und prüfen, daß ein Tonausfall oder Rauschen auftritt.

JUSTIERUNG DES OPTISCHEN ABTASTERS

Meßinstrumente und Spezialwerkzeuge

- Zweikanal-Oszilloskop (mit Trigger) von 30 MHz oder mehr
- Testplatten
  Testplatte (SZZP1014F) alter oder neuer Typ
  Inspektions-Testplatte (SZZP1054C)
  Ungleichmäßige Platte (SZZP1056C)
- Sechskantschlüssel (SZZP1044C...1,5 mm)
- Sechskantschlüssel (1,27 mm)
- Fühlerlehre (RZZ0297)
- Filter
- Schrauben-Versiegelungsfarbe (RZZ0L01)

Justierverfahren

- Wenn der optische Abtaster und der Spindelmotor ausgetauscht werden, die Justierung nach dem folgenden Verfahren durchführen.

Schritt 1: Die einzelnen Regelwiderstände provisorisch justieren.

↓

Schritt 2: Plattentellerhöhe-Justierung

Schritt 3: Mechanische Justierung

↓

Schritt 4: Elektrische Justierung

PLATTENTELLERHÖHE-JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ102** (+) und **TJ302** (−) der Hauptplatine durch das Filter anschließen.
   Oszilloskop-Einstellung:
   VOLT .....50 mV
   KIPP .....1 msec.
   EINGANG .....Gleichstrom
2. Das Oszilloskop auf Gleichstrom-Nullbalance einstellen.
3. Den Netzschalter des Spielers einschalten und eine Testplatte (SZZP1014F oder SZZP1054C) einsetzen.
4. Den Spieler auf Wiedergabe schalten.
5. Den auf dem Oszilloskop angezeigten Gleichstrompegel (A mV) messen.
   Wenn der Wert von A under ±**60 mV** liegt, ist die Plattentellerhöhe korrekt. Wenn er nicht in diesem Bereich liegt, die erforderlichen Justierungen unter Verwendung der 0,9 mm Fühlerlehre (RZZ0297) durchführen. Wenn A mehr als +**60 mV** beträgt, den Plattenteller absenken. Wenn A weniger als −**60 mV** beträgt, den Plattenteller anheben.

Die Plattentellerhöhe wie folgt justieren:

A. Die 0,9 mm Fühlerlehre (RZZ0297) wie unten gezeigt einführen.
B. Die Plattenteller-Stellschraube lösen.
C. Die Plattentellerhöhe durch geringfügiges Bewegen der Fühlerlehre in die entsprechende Richtung justieren.
D. Die Plattenteller-Stellschraube mit dem 1,27 mm Sechskantschlüssel anziehen.
E. Die Plattentellerhöhe-Justierung nach den obigen Schritten 1~5 überprüfen.

MECHANISCHE JUSTIERUNG

1. Kanal 1 des Oszilloskops an **TJ301** (+) und **TJ302** (−) der Hauptplatine anschließen.
   Oszilloskop-Einstellung:
   VOLT .....200 mV
   KIPP .....0,5 μsec.
   EINGANG .....Wechselstrom
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1056C) einsetzen.
3. Mit den Tasten für manuellen Suchlauf den Abtaster so positionieren, daß die Schrauben für mechanische Justierung mit den Justieröffnungen in der Bodenplatte ausgerichtet sind.
4. Unter Beobachtung des HF-Signals auf dem Oszilloskop die **beiden Justierschrauben** abwechselnd mit dem 1,5 mm Sechskantschlüssel (SZZP1044C) so einstellen, daß die vertikalen Schwankungen des HF-Signals minimal und das Augenmuster am weitesten gestreckt wird.
5. Den Netzschalter des Spielers ausschalten.
6. Nach der Justierung **Schrauben-Versiegelungsfarbe** (RZZ0L01) auf die Justierschrauben auftragen.

JUSTIERUNG FÜR VERZERRUNG DES D/A-UMWANDLERS

Meßinstrumente und Spezialwerkzeuge

- Verzerrungsmeter
- Testplatte
  Testplatte (SZZP1014F) alter oder neuer Typ

1. Die Klemme (+) des Verzerrungsmeters an die Ausgangsbuchse (linker oder rechter Kanal) und die Klemme (−) an das Chassis anschließen.
2. Den Netzschalter des Spielers einschalten und die Testplatte (SZZP1014F) einsetzen.
3. Ein 1 kHz, −24 dB Signal wiedergeben.
4. **VR801** (linker Kanal) oder **VR802** (rechter Kanal) so justieren, daß das Verzerrungsverhältnis minimal wird.

OFFSET-AUSGANGSSPANNUNG-JUSTIERUNG

Meßinstrument

- Digital-Voltmeter

1. Die Taste "STOP" drücken und den CD-Spieler auf "STOP MODE" stellen.
2. Den Digital-Voltmeter an den Überbrückungsdraht anschließen, der sich in J (C833) (linker Kanal) (+) oder J (C834) (rechter Kanal) (+) befindet, und an die Ausgangsklemme (GND) (−) anschließen.
3. VR1001 (linker Kanal) oder VR1002 (rechter Kanal) so einstellen, daß die Spannung ±1 mV beträgt.

FRANCAIS

REGLAGES ELECTRIQUES

Appareils de mesure et outillage spécial

- Boîte de réglage du gain de la boucle d'asservissement (SZZP1017F)
- Disques d'essai
  Disque d'essai (SZZP1014F) nouveau ou ancien modèle
  Disque de vérification (SZZP1054C)
  Disque voilé (SZZP1056C)
  Disque à bande noire (SZZP1057C)
- Disque ordinaire
- Oscilloscope double track à déclenchement, 30 MHz (ou mieux)
- Générateur basse fréquence
- Adaptateur (SZZP1032F)
- Filter

Procédure de réglage

1ère étape: Retirer le coffret.

2ème étape: Procéder au réglage préliminaire de chaque résistance variable.

3ème étape: Réglage visuel (Equilibrage du photodétecteur)

4ème étape: Brancher la boîte de réglage du gain de la boucle d'asservissement.

5ème étape: Réglage du gain de focalisation.

6ème étape: Réglage du gain de poursuite.

7ème étape: Réglage de l'erreur de focalisation.

8ème étape: Réglage de l'erreur de poursuite.

9ème étape: Réglage de l'équilibrage de l'erreur de poursuite.

10ème étape: Débrancher la boîte de réglage du gain de la boucle d'asservissement.

11ème étape: Réglage de la boucle de calage en phase (PLL).

12ème étape: Vérification du fonctionnement après réglages.

Réglage préliminaire de chaque résistance variable

Remarque:
Si la lecture du disque est impossible ou que des sauts de portions enregistrées apparaissent, procéder au réglage de chaque résistance variable comme il est indiqué ci-après.

REGLAGE VISUEL (EQUILIBRAGE DU PHOTO-DETECTEUR)

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV
   BALAYAGE ....0,5 μs
   ENTREE .....CA
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
3. Procéder à la lecture du disque.
4. Régler **VR101** de sorte que la figure du signal radiofréquence soit aussi étirée que possible.
5. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.

REGLAGE DU GAIN DE FOCALISATION

1. Brancher la boîte de réglage du gain de la boucle d'asservissement.
2. Placer le commutateur de cette boîte sur la position **2** et l'interrupteur d'alimentation sur la position **ON**.
3. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **750 Hz** avec une amplitude de **100 mV crête à crête**. Brancher ce générateur entre les bornes **OSC** (+) et **GND** (−) de la boîte de réglage.
4. Relier les entrées (CH1 et CH2) de l'oscilloscope aux bornes **TP1** et **TP2** de la boîte de réglage. (**TP3** est la borne de masse.)
   Réglages de l'oscilloscope:
   TENSION .....200 mV (sur les deux entrées)
   BALAYAGE ....1 ms
   ENTREE CC
5. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
6. Procéder à la lecture du disque.
7. Basculer le commutateur de la boîte de réglage de la position **2** à la position **3**.
8. Deux traces du signal à **750 Hz** apparaissent sur l'écran de l'oscilloscope. Régler **VR104** de sorte que les amplitudes des deux traces soient identiques.
9. Basculer le commutateur de la boîte de réglage de la position **3** à la position **2**.

REGLAGE DU GAIN DE POURSUITE

1. Les raccordements et les réglages de l'oscilloscope sont identiques à ceux du réglage précédent.
2. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **1,0 kHz** avec une amplitude de **100 mV crête à crête**.
3. Basculer le commutateur de la boîte de réglage de la position **2** à la position **1**.
4. Deux traces du signal à **1,0 kHz** apparaissent sur l'écran de l'oscilloscope. Régler **VR102** de sorte que les amplitudes des deux traces soient identiques.
5. Basculer le commutateur de la boîte de réglage de la position **1** à la position **2**.
6. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.

REGLAGE DE L'ERREUR DE FOCALISATION

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Relier l'entrée 2 (CH2) de l'oscilloscope aux bornes **TJ102** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV (sur les deux entrées)
   BALAYAGE ....0,5 ms
   ENTREE .....CA (CH1), CC (CH2)
   MODE .....NORM (le déclenchement est commandé par CH1)
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disques d'essai (SZZP1057C).
3. Procéder à la lecture du disque.
4. Observer les deux traces et régler **VR105** de sorte que l'allure des courbes au voisinage du point de déclenchement soit celle de l'illustration.

REGLAGE DE L'ERREUR DE POURSUITE

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Relier l'entrée 2 (CH2) de l'oscilloscope aux bornes **TJ101** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV (sur les deux entrées)
   BALAYAGE ....0,5 ms
   ENTREE .....CA (CH1), CC (CH2)
   MODE .....NORM (le déclenchement est commandé par CH1)
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disque d'essai (SZZP1057C).
3. Procéder à la lecture du disque.
4. Observer les deux traces et régler **VR103** de sorte que l'allure des courbes au voisinage du point de déclenchement soit celle de l'illustration.

REGLAGE DE L'EQUILIBRE DE L'ERREUR DE POURSUITE

1. Régler le générateur basse fréquence de sorte que le signal de sortie soit à la fréquence de **1 kHz** avec une amplitude de **200 mV crête à crête**. Brancher ce générateur entre les bornes **OSC** (+) et **GND** (−) de la boîte de réglage.
2. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....500 mV
   BALAYAGE ....0,5 ms
   ENTREE .....CA
3. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
4. Procéder à la lecture du disque.
5. Basculer le commutateur de la boîte de réglage de la position **2** à la position **1**.
6. Régler **VR106** de sorte que l'allure du signal soit celle de l'illustration (l'instabilité de phase est minimale).
7. Basculer le commutateur de la boîte de réglage de la position **1** à la position **2**.
8. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.
9. Débrancher la boîte de réglage et replacer le connecteur de court-circuit de CN102 dans la position d'origine.

REGLAGE DE LA BOUCLE DE CALAGE EN PHASE

1. Brancher l'entrée (CH1) de l'oscilloscope entre la borne de sorte ligne **(LINE OUT)** de la voie droite ou gauche et la **masse**.
   Réglages de l'oscilloscope:
   TENSION .....1 V
   BALAYAGE ....1 ms
   ENTREE CC
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disques d'essai (SZZP1054C).
3. Lire la **plage No. 6** du disque **(coin 0,7 mm)**.
4. Observer l'allure du signal sur l'oscilloscope et régler **VR501** de la manière suivante:
   1ère étape: Tourner **VR501** doucement dans le sens des aiguilles d'une montre et noter le moment où le signal commence à être perturbé.
   2ème étape: Tourner **VR501** doucement dans le sens contraire des aiguilles d'une montre et noter le moment où le signal commence à être perturbé.
   3ème étape: Régler **VR501** au milieu des deux positions notées au cours des opérations **1** et **2** ci-dessus.

VERIFICATION DU FONCTIONNEMENT APRES REGLAGES

Vérification du saut de plage

1. Lire un disque ordinaire.
2. Appuyer sur la touche de commande de saut de plage et s'assurer que le fonctionnement est correct dans les deux sens.

Vérification de la recherche manuelle

1. Lire un disque ordinaire.
2. Appuyer sur la touche de recherche manuelle et s'assurer que le fonctionnement s'effectue sans à-coups dans les deux vitesses possibles.

Vérification de la lecture

1. Mettre en place un des disques d'essai (SZZP1054C).
2. Lire la **plage No. 6 (coin 0,7 mm)** et s'assurer qu'il n'y a ni bruit ni perte de signal.
3. Lire la **plage No. 13 (point noir 0,7 mm)** et s'assurer qu'il n'y a ni bruit ni perte d'information.

REGLAGE DU CAPTEUR OPTIQUE

Appareils de mesure et outillage spécial

- Oscilloscope double trace à déclenchement, 30 MHz (ou mieux)
- Disques d'essai
  Disque d'essai (SZZP1014F) nouveau modèle ou ancien modèle
  Disque de vérification (SZZP1054C)
  Disque voilé (SZZP1056C)
- Clé hexagonale (SZZP1044C...1,5 mm)
- Clé hexagonale (1,27 mm)
- Jauge d'épaisseur (RZZ0297)
- Filtre
- Vernis de blocage (RZZ0L01)

Procédure de réglage

- Si le capteur optique ou le circuit imprimé du moteur de rotation sont remplacés, procéder aux réglages en suivant la procédure décrite ci-dessous.

1ère étape: Procéder au réglage préliminaire de chaque résistance variable.

2ème étape: Réglage de la hauteur de la platine.

3ème étape: Réglage mécanique.

4ème étape: Réglage électrique.

REGLAGE DE LA HAUTEUR DE LA PLATINE

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ102** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....50 mV
   BALAYAGE ....1 ms
   ENTREE CC
2. Régler l'oscilloscope de sorte que la trace soit au centre lorsque l'entrée est égale à 0 V.
3. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un disque d'essai (SZZP1014F ou SZZP1054C).
4. Procéder à la lecture du disque.
5. Mesurer la tension continue (A mV) du signal apparaissant sur l'oscilloscope.
   Si la valeur A est à l'intérieur de la fourchette ±**60 mV**, la hauteur de la platine est correcte. Dans la cas contraire, procéder aux réglages requis en employant la jauge de profondeur (RZZ0297). Si A est supérieure à +**60 mV**, diminuer la hauteur de la platine. Si A est inférieure à −**60 mV**, augmenter la hauteur de la platine.

Réglage de la hauteur de la platine:

A. Introudiure la jauge de 0,9 mm (RZZ0297) comme il est indiqué ci-dessous.
B. Dévisser la vis de positionnement de la platine.
C. Régler la hauteur de la platine en déplaçant légèrement la jauge dans la direction voulue.
D. Resserrer la vis de positionnement au moyen de la clé de 1,27 mm.
E. Vérifier la hauteur de la platine en procédant aux opérations 1 à 5 décrites ci-dessus.

REGLAGE MECANIQUE

1. Relier l'entrée 1 (CH1) de l'oscilloscope aux bornes **TJ301** (+) et **TJ302** (−) du circuit imprimé principal.
   Réglages de l'oscilloscope:
   TENSION .....200 mV
   BALAYAGE ....0,5 μs
   ENTREE .....CA
2. Placer l'interrupteur d'alimentation du lecteur sur la position **ON** et mettre en place un des disques d'essai (SZZP1056C).
3. A l'aide des touches de recherche, déplacer le capteur de telle manière que les vis de réglage mécanique apparaissent à travers les trous pratiqués sur le fond de l'appareil.
4. Observer l'allure du signal radiofréquence sur l'oscilloscope et agir alternativement sur les **deux vis** à l'aide de la clé hexagonale (SZZP1044C) de sorte que la fluctuation verticale des courbes soit minimale et que leur forme soit aussi étirée que possible.
5. Placer l'interrupteur d'alimentation du lecteur sur la position **OFF**.
6. Le réglage terminé, appliquer une **goutte de vernis de blocage** (RZZ0L01) sur la vis de réglage.

REGLAGE DE LA DISTORSION DU CONVERTISSEUR D/A

Appareils de mesure et outillage spécial

- Distorsiomètre
- Disque d'essai
  Disque d'essai (SZZP1014F) nouveau ou ancien modèle

1. Relier la borne (+) du distorsiomètre une borne de sortie (voie droite ou voie gauche) et la borne (−) au châssis.
2. Placer l'interrupteur d'alimentation du lecteur sur la position ON et mettre en place un des disques d'essai (SZZP1014F).
3. Procéder à la lecture (1 kHz, −24 dB).
4. Régler **VR801** (voie gauche) ou **VR802** (voie droite) de sorte que la distorsion soit minimale.

COMPENSATION DU NIVEAU DE SORTIE

Reglage audio

- Voltmètre digital

1. Appuyer sur la touche "STOP" pour amener le lecteur à l'arrêt.
2. Brancher le voltmètre digital entre J (C833) (Voie gauche) (+) ou J (C834) (Voie droite) (+) et la borne de sortie (GND) (−).
3. Régler VR1001 (Voie gauche) ou VR1002 (Voie droite) de sorte que la tension soit égale à ±1 mV.

ESPAÑOL

AJUSTE ELECTRICO

Instrumentos de medición y herramientas especiales

- Ajustador de servoganancia (SZZP1017F)
- Discos de prueba
  Disco de prueba (SZZP1014F) tipo antiguo o nuevo
  Disco de prueba de inspección (SZZP1054C)
  Disco desparejo (SZZP1056C)
  Disco de banda negra (SZZP1057C)
- Disco común
- Osciloscopio de dos canales (con disparador) de 30 MHz o más
- Oscilador de baja frecuencia
- Conector de conversión (SZZP1032F)
- Filtro

Procedimiento de ajuste

Paso 1: Saque el mueble.
↓
Paso 2: Realice el ajuste temporario de cada VR.
↓
Paso 3: Ajuste visual óptimo (equilibrio de PD [diferencia de potencia]).
↓
Paso 4: Conecte el ajustador de servoganancia.
↓
Paso 5: Ajuste la ganancia de enfoque.
↓
Paso 6: Ajuste la ganancia de seguimiento.
↓
Paso 7: Ajuste la desviación de enfoque.
↓
Paso 8: Ajuste la desviación de seguimiento.
↓
Paso 9: Ajuste el balance de desviación.
↓
Paso 10: Desconecte el ajustador de servoganancia.
↓
Paso 11: Ajuste el PLL (Bucle de enganche de fase).
↓
Paso 12: Compruebe el funcionamiento después del ajuste.

AJUSTE TEMPORARIO DE CADA VR

Nota:
Si el disco salta o no puede reproducirse, ajuste temporariamente cada VR como se muestra.

AJUSTE VISUAL OPTIMO (EQUILIBRIO DE PD)

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. (tablero de circuitos impresos) principal.
   Puesta de osciloscopio: VOLT .....200 mV
   Barrido .....0,5 μseg.
   Entrada .....CA
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
3. Ponga el reproductor en la modalidad de reproducción.
4. Ajuste **VR101** de modo que el patrón visual de la señal de RF se ensanche al máximo.
5. Ponga el interruptor de alimentación del reproductor en la posición **OFF**.

AJUSTE DE LA GANANCIA DE ENFOQUE

1. Conecte el ajustador de servoganancia.
2. Ponga el conmutador selector del ajustador de servoganancia en **2** y el interruptor ON-OFF en **ON**.
3. Ajuste el oscilador de baja frecuencia a la frecuencia de **750 Hz** y voltaje de salida a **100 mVp-p**. Luego conecte el oscilador a los terminales **OSC** (+) y **GND** (−) del ajustador de servoganancia.
4. Conecte CH1 y CH2 del osciloscopio a **TP1** y **TP2** del ajustador de servoganancia (**TP3** es el terminal de puesta a tierra).
   Puesta de osciloscopio:
   VOLT .....200 mV (ambos canales)
   BARRIDO .....1 mseg.
   ENTRADA.....CC
5. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
6. Ponga el reproductor en la modalidad de reproducción.
7. Cambie el conmutador selector del ajustador de servoganancia de **"2"** a **"3"**.
8. En el osciloscopio se visualizarán señales de **750 Hz**. Ajuste **VR104** hasta que las amplitudes de la forma de onda de ambos canales sean iguales.
9. Cambie el conmutador selector del ajustador de servoganancia de **"3"** a **"2"**.

AJUSTE DE LA GANANCIA DE SEGUIMIENTO

1. La puesta del osciloscopio y las conexiones son las mismas que las indicadas anteriormente.
2. Ponga el oscilador de baja frecuencia a **1,0 kHz** y voltaje de salida de **100 mVp-p**.
3. Cambie el conmutador selector del ajustador de servoganancia de **"2"** a **"1"**.
4. En el osciloscopio se visualizarán señales de **1,0 kHz**. Ajuste **VR102** hasta que las amplitudes de la forma de onda de ambos canales sean iguales.
5. Cambie el conmutador selector del ajustador de servoganancia de **"1"** a **"2"**.
6. Ponga en **OFF** el interruptor de alimentación del reproductor.

AJUSTE DE LA DESVIACION DE ENFOQUE

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Conecte CH2 del osciloscopio a **TJ102** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio:
   VOLT .....200 mV (ambos canales)
   Barrido.....0.5 mseg.
   Entrada .....CA (CH1), CC (CH2)
   Modalidad.....NORM (Disparo vía CH1)
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1057C).
3. Ponga el reproductor en la modalidad de reproducción.
4. Verifique la forma de onda de CH1 y CH2 en el osciloscopio, y ajuste **VR105** de modo que la forma de onda alrededor del punto de disparo sea como la que se muestra en la figura.

AJUSTE DE LA DESVIACION DE SEGUIMIENTO

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Conecte CH2 del osciloscopio a **TJ101** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio:
   VOLT .....200 mV (ambos canales)
   Barrido.....0,5 mseg.
   Entrada .....CA (CH1), CC (CH2)
   Modalidad.....NORM (Disparo vía CH1)
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1057C).
3. Ponga el reproductor en la modalidad de reproducción.
4. Verifique la forma de onda de CH1 y CH2 en el osciloscopio y ajuste **VR103** de modo que la forma de onda alrededor del punto de disparo sea como la que se muestra en la figura.

AJUSTE DEL EQUILIBRIO DE DESVIACION DEL SEGUIMIENTO

1. Ajuste el oscilador de baja frecuencia a la frecuencia de **1 kHz** y voltaje de salida de **200 mVp-p**. Luego conecte el oscilador a los terminales **OSC** (+) y **GND** (−) del ajustador de servoganancia.
2. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio: VOLT .....500 mV
   Barrido .....0,5 mseg.
   Entrada .....CA
3. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
4. Ponga el reproductor en la modalidad de reproducción.
5. Cambie el conmutador selector del ajustador de servoganancia de **"2"** a **"1"**.
6. Ajuste **VR106** de modo que la forma de onda de la salida sea como se muestra (la fluctuación se hace mínima).
7. Lleve el conmutador selector del ajustador de servoganancia de **"1"** a **"2"**.
8. Ponga en **OFF** el interruptor de alimentación del reproductor.
9. Desconecte el ajustador de servoganancia, inserte el conector de cortocircuito de CN102 en la posición original.

ESPAÑOL SL-P770

AJUSTE DEL PLL (BUCLE DE ENGANCHE DE FASE)

1. Conecte CH1 del osciloscopio al **terminal LINE OUT** (del canal L o del R) y a **tierra**.
   Puesta de osciloscopio: VOLT .....1 V
   Barrido .....1 mseg.
   Entrada CC
2. Ponga el interruptor de alimentación del reproductor en **ON** e inserte un disco de prueba (SZZP1054C).
3. Reproduzca el **surco No. 6 (cuña de 0,7 mm)** del disco de prueba.
4. Verifique la forma de onda que se visualiza en el osciloscopio y ajuste **VR501** de acuerdo con los siguientes pasos.
   Paso 1. Gire lentamente **VR501** en el sentido de las manecillas del reloj y observe el punto en el que la forma de onda del osciloscopio comienza a deformarse.
   Paso 2. Gire lentamente **VR501** en el sentido contrario a las manecillas del reloj y observe el punto en que la forma de la onda del osciloscopio comienza a deformarse.
   Paso 3. Fije **VR501** en la posición intermedia entre los puntos observados en los pasos anteriores **"1"** y **"2"**.

COMPROBACION DEL FUNCIONAMIENTO DE REPRODUCCION DESPUES DEL AJUSTE

Comprobación de exploración de salto

1. Reproduzca un disco común.
2. Pulse el botón de salto para comprobar la exploración de salto (tanto en la modalidad directa como en la inversa).

Comprobación de exploración manual

1. Reproduzca un disco común.
2. Pulse el botón de exploración manual para comprobar si la exploración manual se puede realizar suavemente a velocidades bajas y altas (tanto en la modalidad directa como en la inversa).

Comprobación de reproducibilidad

1. Reproduzca el disco de prueba (SZZP1054C).
2. Reproduzca el **surco No. 6 (cuña de 0,7 mm)** y verifique si no hay salto de sonido o ruido.
3. Reproduzca el **surco No. 13 (punto negro de 0,7 mm)** y verifique si no hay salto de sonido o ruido.

AJUSTE DE LA TOMA OPTICA

Instrumentos de medición y herramientas especiales

- Osciloscopio de dos canales (con disparador) de 30 MHz o más
- Discos de prueba
  Disco de prueba (SZZP1014F) tipo antiguo o nuevo
  Disco de prueba de inspección (SZZP1054C)
  Disco desparejo (SZZP1056C)
- Llave de tuercas hexagonal (SZZP1044C...1,5 mm)
- Llave de tuercas hexagonal (1,27 mm)
- Calibre de espesor (RZZ0297)
- Filtro
- Adherencia de cierre de tornillo (RZZ0L01)

Procedimiento de ajuste

- Si se cambia la toma óptica y el motor del eje, ajústelos de acuerdo con el siguiente procedimiento.

Paso 1: Ajustar temporariamente cada VR.
↓
Paso 2: Ajuste la altura del plato giradiscos.
↓
Paso 3: Ajuste mecánico.
↓
Paso 4: Ajuste eléctrico.

AJUSTE DE LA ALTURA DEL PLATO GIRADISCOS

1. Conecte CH1 del osciloscopio a **TJ102** (+) y **TJ302** (−) del P.C.B. principal a través del filtro.
   Puesta de osciloscopio: VOLT .....50 mV
   Barrido .....1 mseg.
   Entrada CC
2. Ajuste el equilibrio cero de CC del osciloscopio.
3. Lleve el interruptor de alimentación del reproductor a **ON** e inserte un disco de prueba (SZZP1014F o SZZP1054C).
4. Ponga el reproductor en la modalidad de reproducción.
5. Mida el nivel de CC (AmV) que se visualiza en el osciloscopio.
   Si el valor de A está dentro de la gama de ±**60 mV**, la altura del plato giradiscos es correcta. Si no está dentro de esta gama, realice los ajustes necesarios utilizando el calibre de espesor (RZZ0297). Si A es mayor que +**60 mV**, baje el plato giradiscos. Si A es menor que −**60 mV**, levante el plato giradiscos.

Ajuste la altura del plato giradiscos de la siguiente forma:

A. Inserte el calibre de espesor de 0,9 mm (RZZ0297), como se muestra abajo.
B. Afloje el tornillo de ajuste del plato giradiscos.
C. Ajuste la altura del plato giradiscos moviendo el calibre levemente en la dirección apropiada.
D. Apriete el tornillo de ajuste del plato giradiscos usando la llave de tuerca hexagonal de 1,27 mm.
E. Compruebe el ajuste de la altura del plato giradiscos siguiendo los pasos 1~5 anteriores.

AJUSTE MECANICO

1. Conecte CH1 del osciloscopio a **TJ301** (+) y **TJ302** (−) del P.C.B. principal.
   Puesta de osciloscopio: VOLT .....200 mV
   Barrido .....0,5 μseg.
   Entrada .....CA
2. Lleve el interruptor de alimentación del reproductor a **ON** e inserte el disco de prueba (SZZP1056C).
3. Utilizando los botones de exploración manual, mueva la toma de modo que los tornillos de ajuste mecánico se alineen con los orificios de ajuste del panel inferior.
4. Mientras comprueba la señal de RF del osciloscopio, apriete los **dos tornillos de ajuste** alternativamente con la llave hexagonal de 1,5 mm (SZZP1044C) de modo que la fluctuación vertical de la señal de RF se haga mínima y que el patrón visual se ensanche al máximo.
5. Lleve el interruptor de alimentación del reproductor a **OFF**.
6. Después del ajuste, aplique **adherencia de cierre de tornillo** (RZZ0L01) a los tornillos de ajuste.

AJUSTE DE LA DISTORSION DEL CONVERTIDOR D/A

Instrumentos de medición y herramientas especiales

- Medidor de distorsión
- Disco de prueba
  Disco de prueba (SZZP1014F) tipo antiguo o nuevo

1. Conecte el terminal (+) del medidor de distorsión al terminal de salida (canal L o R) y al terminal (−) del chasis.
2. Lleve el interruptor de alimentación del reproductor a ON e inserte el disco de prueba (SZZP1014F).
3. Reproduzca la señal 1 kHz, −24 dB.
4. Ajuste **VR801** (canal L) o **VR802** (canal R) de modo que la relación de distorsión sea mínima.

ADJUSTE DEL AUDIO

Instrumento de medición

- Voltímetro digital

1. Pulse el botón de parada (STOP) y ponga el reproductor en la modalidad de parada.
2. Conecte el voltímetro digital al cable de conexión montado en J (C833) (Lch) (+) o J (C834) (Rch) (+) y al terminal de salida (GND) (−).
3. Ajuste VR1001 (Lch) o VR1002 (Rch) de modo que el voltaje sea ±1 mV.

Printed in Japan
S880105200TK/HS

ORDER NO. HAD8802031S0
A6

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-P770

Color	Area
(K)	[M] ..... U.S.A.
(K)	[MC] ... Canada.
(K)	[E] ..... Continental Europe.
(K)	[EK] .... United Kingdom.
(K)	[XL] .... Australia.
(K)	[EG] ... F.R.Germany.
(K)	[EB] .... Belgium.
(K)	[EH] .... Holland.
(K)	[EF] .... France.
(K)	[Ei] ..... Italy.
(K)	[XA] .... Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[XB] .... Saudi Arabia.
(K)	[PA] .... Far East PX.
(K)	[PE] .... European Military.
(K)	[PC] .... European Audio Club.

Please file and use this supplement manual together with the service manual for Model No. SL-P770, Order No. HAD8801018C0.

Note: This supplement has been issued to inform you that the service manual for Model No. SL-P770 contains some incorrect information in "MEASUREMENTS AND ADJUSTMENTS" on page 24 and 25. Please kindly correct your service manual as follows.

(over)

Technics

Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc.
Ave. 65 De Infanteria, Km. 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

Panasonic Hawaii, Inc.
91-238, Kauhi Street, Ewa Beach
P.O. Box 774
Honolulu, Hawaii 96808-0774

Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome,
Minato-ku, Tokyo 105, Japan

CORRECTION

■ MEASUREMENTS AND ADJUSTMENTS

OPTICAL PICKUP ADJUSTMENT

INCORRECT **CORRECT**

(On page 24.)

Measuring Instruments and Special Tools

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- Hexagonal wrench (SZZP1044C....1.5mm)
- Screw lock paint (RZZ0L01)
- Hexagonal wrench (1.27mm)
- Feeler gauge (RZZ0297)
- Filter (Refer to page 20.)

Measuring Instruments and Special Tools

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- **Hexagonal wrench (2.0mm)**
- Screw lock paint (RZZ0L01)
- Hexagonal wrench (1.27mm)
- Feeler gauge (RZZ0297)
- Filter (Refer to page 20.)

(On page 25.)

MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1056C).
3.Using the manual search buttons , move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.
4.Monitoring RF signal on the oscilloscope, adjust **the two adjusting screws** alternatelywith the 1.5mm hexagonal wrench (SZZP1044C) so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.

MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1056C).
3.Using the manual search buttons , move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.
4. Monitoring RF signal on the oscilloscope, adjust the two adjusting screws alternately with the 2.0 mm hexagonal wrench so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.

Printed in Japan
S880210200HS